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DOMESTIC ENGINEERING

Plumbing & Hea... ...Merchandising

A Honolulu office building. In excavating, fresh and salt water caused trouble, but were made to serve

Turning Difficulties to Advantage

MARCH 8, 1930

KEWANEE

Water Heating GARBAGE BURNERS

Make it a *complete* Kewanee installation by selling a Kewanee Water Heater and Tank when you sell the Kewanee Boiler.

Here is a water heater that *does more* than heat water. For it is also a garbage and rubbish incinerator, using such refuse as part of the necessary fuel—saving from 30 to 50 per cent of the fuel needed by ordinary heaters. And the garbage and rubbish is disposed of in a sanitary way.

Built in three types and fourteen sizes; to raise the temperature of from 200 to 2600 gallons of water, 50 degrees per hour; there is a Kewanee for every building.

Its husky steel riveted construction guarantees it lasting as long as the building.

KEWANEE BOILER CORPORATION

division of American Radiator and Standard Sanitary Corporation

KEWANEE, ILLINOIS

Branches in 40 Principal Cities

Hot Water is as Necessary as Heat

Coldie Says VOGEL Helps Plumbers Make Profits

Plumbers all know
That Vogel makes
A Frost-Proof Closet
That never breaks

And every one knows
Throughout the trade
That Vogel products
Are highest grade

They've been advertised
To your customers, too
And this has meant bigger
Profits for you

With publication
And direct-by-mail
Vogel's been helping you
Make the sale

There's always been plenty
Of profits to make
On Vogel Frost-Proofs
That never break

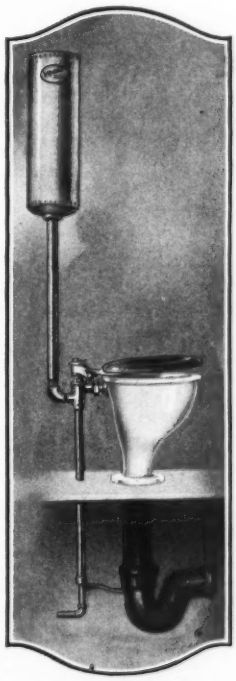
VOGEL Frost-Proof Closets and Hydrants, for installation in mill villages and all exposed places, have been sold through jobbers and plumbers for more than 20 years.

This policy, together with publication and direct-by-mail advertising to plumbers' customers, has made it profitable for you to push the Vogel line.

If you need any sales helps such as blotters, stickers, or folders, imprinted with your name and address, let us know how many and we'll send them gladly.

MORE THAN 20 YEARS CONTINUOUS ADVERTISING TO YOUR CUSTOMERS HAS MADE IT PROFITABLE FOR EVERY PLUMBER TO PUSH THE VOGEL LINE - - - - - -

There's a lot of profit to be made pushing **Vogel Frost-Proof Hydrants.** Has the same wear-proof supply valve as the Vogel Number One Closet.



Vogel Number One Frost-Proof Closet
Strong and Economical
Over 500,000 in use giving satisfactory service.

JOSEPH A. VOGEL COMPANY
Wilmington, Delaware St. Louis, Mo.

See inside back page for VOGEL SELFLUSH advertisement.

VOGEL *Frost-Proof Products*

DOMESTIC ENGINEERING

Plumbing & Heating Contracting and Merchandising

Established 1889

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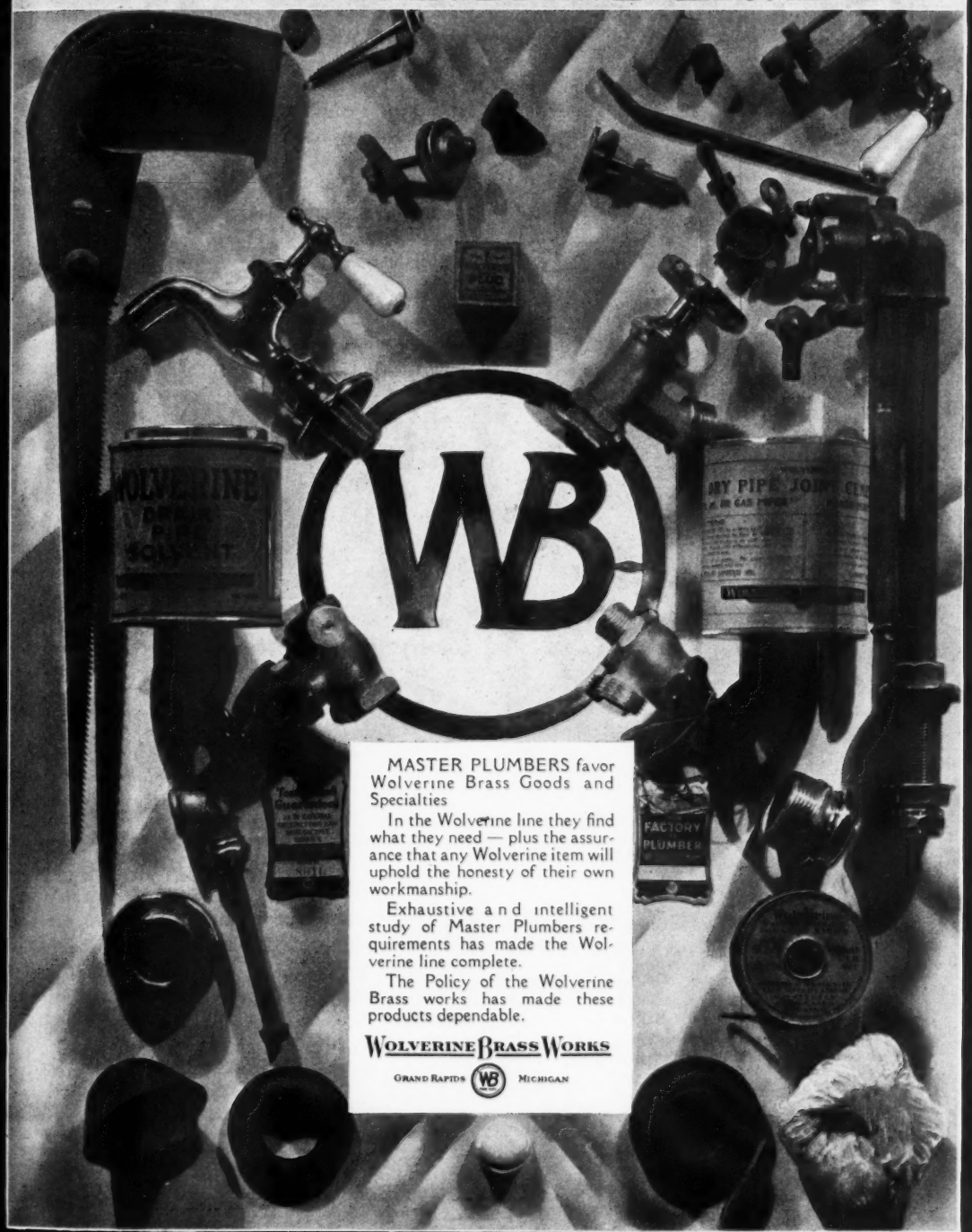
WOLVERINE

COMPLETE-DEPENDABLE

•THE WOLVERINE LINE•



MASTER PLUMBERS favor Wolverine Brass Goods and Specialties

In the Wolverine line they find what they need — plus the assurance that any Wolverine item will uphold the honesty of their own workmanship.

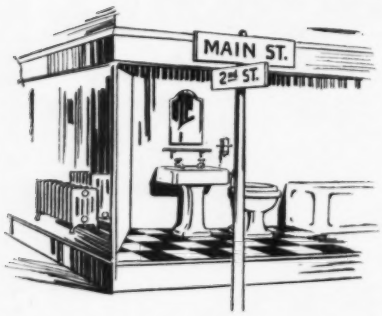
Exhaustive and intelligent study of Master Plumbers requirements has made the Wolverine line complete.

The Policy of the Wolverine Brass works has made these products dependable.

WOLVERINE BRASS WORKS

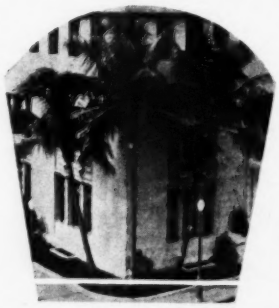
GRAND RAPIDS WB MICHIGAN

Between Ourselves



I HAVE stood by and watched one retailer look at another in goggle-eyed worship without ever thinking to follow the lead of the more successful man, and become a big man himself. The little man crowns the other fellow with a halo, but goes right on in the same old rut. I have heard them lament, "Well, those things may be all right for the big retailer, but they won't work in my case. He can advertise and all that, but it would be a waste of money for me." Frankly, it gives me annoyance to hear things like that. The little fellow should try wearing the halo himself; he'd be surprised to see how well he looked in it.

Take the case of Joseph M. Griffin of Baltimore. He has been willing to try a new angle now and then; he has made up his mind that what the big fellow can do, so can he. Other retailers advised him that advertising and merchandising were for the big fellow, but Mr. Griffin did some thinking for himself and took a chance. He installed an attractive display and started a system of bookkeeping. He adopted the use of inspection cards showing the equipment on the premises of every home he had entered, keeping track of the condition of every fixture. He bought a small mimeograph and sent out letters regularly. Then, to make his workmen contented, Mr. Griffin tried a plan of giving bonuses on jobs that the mechanics finished ahead of estimated time. Mr. Griffin became a merchant and a business man. Read about it in this issue's Merchandising Feature Section.



YOU think of Hawaii as a place of eternal sunshine, where life is easy and the population frolics on the sand by the sea all day long, but did you ever think of it as a place where an ordinary plumbing installation becomes a feat of engineering? Putting a plumbing system in a new building in Honolulu, as told in the story in this issue, "Turning Difficulties to Advantage," becomes a romance like digging a Panama Canal. I would say, read it.

◆

HERE is a story for you, brief and to the point, for as surely as the soul of wit is in brevity, the value of an article lies in conveying the most sense in the fewest words. This story, "Accurate Estimating Determines Success in Oil Burner Selling," tells you how to make money; I can say no more.

Thank You!

I WISH to say you will never know the appreciation with which I received your editorial.

Your editorial certainly points to the vital problem in the plumbing and heating industry today. And I wish to say that this editorial came at a very opportune time. We know that everything you have said in this editorial is true. (W. T. Polley, Hutchinson, Kans.)

The man who is so busy that he does not have time to read his trade paper is like the man who was so busy chopping wood that he did not have time to sharpen his axe

Your Editor

A New and Improved Jacketed Boiler

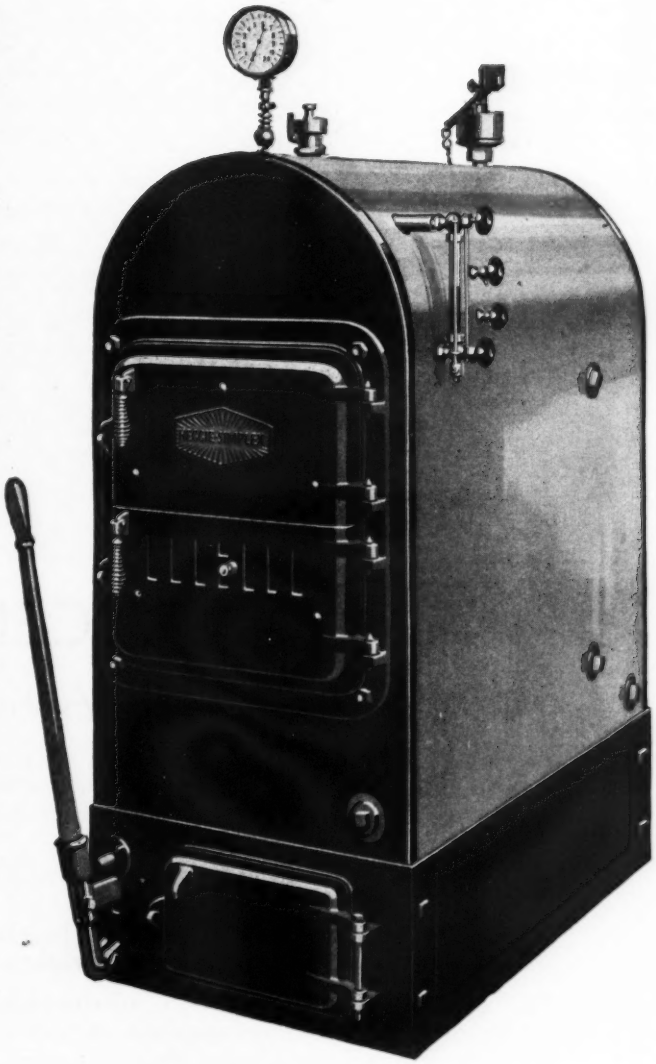
IT has always been a Heggie-Simplex policy to adopt new features as soon as they have been proved distinct advancements over the old. And now, Heggie-Simplex announces important improvements in its jacketed line of boilers.

The new design of the jacket makes this one-piece steel boiler the simplest of all jacketed boilers to install. The boiler itself is made to templates with every flanged opening located with jigs. The jacket is die-cut so that absolute accuracy of fit is assured. The insulation of mineral wool is already in place as a lining to the jacket. No separate handling, fitting or trimming is required.

The finish is of the same smart, yet practical dust-concealing French Grey that made the first Heggie-Simplex Jacketed Boiler so popular with women. In these new boilers, however, by a special enameling process, the finish is even more lustrous, beautiful and durable. Trimmings are jet black.

The boiler itself, built of steel, fused by electric welding into one seamless crack-proof unit, incorporates the same principles of operation as the previous Heggie-Simplex Jacketed model. An extra large firebox, large heating surface, tubular flues and unrestricted water circulation assure a degree of efficiency which only the owners of large buildings, using large steel boilers, could heretofore obtain. The boiler is readily adaptable to use with any fuel—coal, coke, gas, oil—and to hand or automatic firing.

For full particulars write Heggie-Simplex Boiler Co., Joliet, Ill. Representatives in principal cities —telephone and address listed under "Heggie-Simplex Boilers."

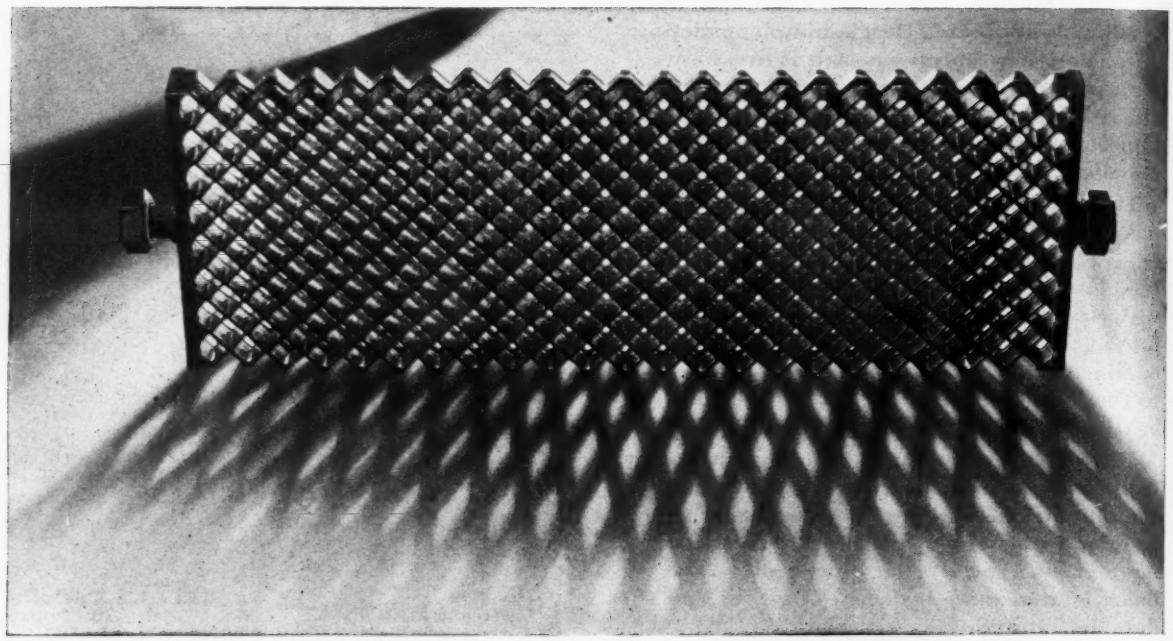


The improvements now incorporated in Heggie-Simplex Jacketed Boilers represent the experience of thirty-eight years of boiler engineering. They anticipate the practical requirements which architects, heating engineers and owners will demand of jacketed boilers in the future.

HEGGIE-SIMPLEX

STEEL HEATING BOILERS

MULTICELL



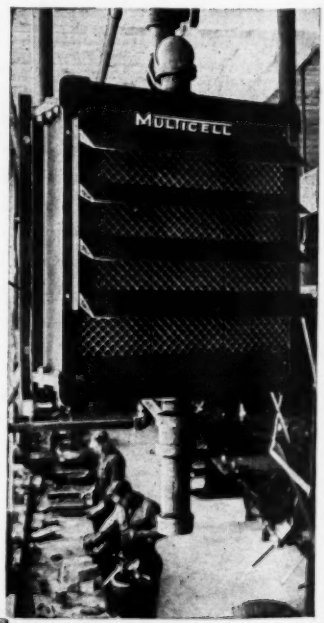
Only MULTICELL
can give this NEW RADIATION

THEY said it couldn't be done . . . and MULTICELL did it! By using the old principle of electrical deposition, improved and patented, Multicell engineers have produced the only unit heater in the world . . .

1. That is made of one piece, seamless, pure copper sections.
2. That presents 100% prime heating surface.

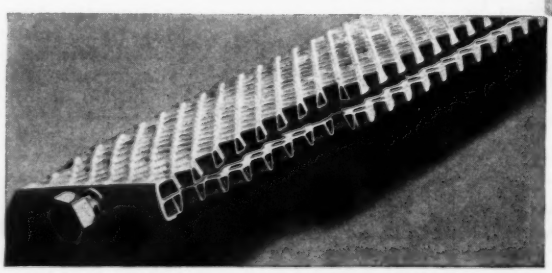
These features alone result in maximum heat transfer with a previously impossible minimum area, weight and resistance.

The rest of the Multicell story . . . its compact light weight, its leak-proof expansion and contraction, its freedom from fins and dust, its simple installation and unequalled economies of operation and maintenance . . . is available to every heating and plumbing engineer or contractor. Permit us to send you, without obligation, the complete array of Multicell facts.



MULTICELL
RADIATOR
CORPORATION

LOCKPORT,
NEW YORK



Above: Showing the convenience and simplicity of a typical Multicell installation.

Left: Cut-away section of a Multicell element showing ample steam and waterways and efficient design for maximum heat transfer.

Multicell surface is available without frame or motor to suit special requirements.

Burnham Boilers

When There's a Mile of New Business to Move Get the Wheels Turning With Burnhams

MAYBE you've waited, like I have, at the crossing, to let a mile of freight cars rattle by.

And while you waited you wondered a bit how the big compound locomotive could possibly be big enough to keep all those cars moving.

It couldn't either, if it were not for the second cylinder, that gets the last ounce of power out of the steam.

Burnham long fire travel is a lot like that second cylinder. It extracts the last heat kick from the gases, before it lets them go.

You're wanting to move a mile of boiler business this year. Then why not back up these double action Burnhams to the front end of that mile and see how quick things get rolling.

There's a Burnham Boiler for Every Heating Purpose. Send for the Catalogue.

Burnham Boiler Corporation

IRVINGTON, N. Y.

Representatives in all principal cities of the United States and Canada

New · amazing · different · · · · · a fitting skilfully designed for the skilled plumber

Mueller ★Streamline Fittings

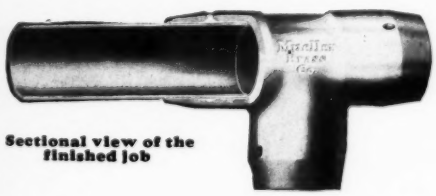
A fitting for use with Mueller Copper Water Tube for plumbing that requires YOUR skill to connect, that solves all of your fitting problems and that gives you a job of greatest permanence and lasting fine appearance. A fitting used with Mueller Copper Water Tube that gives your customer an installation that will withstand repeated freezing, that forever banishes the threats of rust, corrosion and water stain. A fitting that is economical in the extreme, that requires less space on any job, that is smaller, yet of greater strength. A fitting that assures the flow capacity being permanently uniform.

★ Streamline · Hydrodynamics · A line of uninterrupted flow free from eddies · graceful flowing appearance, etc. — (Funk & Wagnalls Standard Dictionary.)

The new MUELLER STREAMLINE FITTING is threadless and is designed to make a conveniently soldered connection to MUELLER COPPER WATER TUBE for plumbing and heating installations.

There are several distinct mechanical features utilized in the construction of Mueller Streamline Fittings.

Plumber making connection with Mueller Streamline fitting to Mueller Copper Water Tube. Note the neat, compact, streamline appearance of the finished job.



Sectional view of the finished job

The pipe openings in the fittings are machined to close tolerances and the pipe, when inserted in the fitting, fits snugly.

The distance to which the fitting may be inserted in the pipe has been carefully determined and made positive by a shoulder in the fitting itself against which the pipe rests. This shoulder is the same thickness as the pipe wall, thus insuring a continuous, uninterrupted waterway that cuts flow resistance to a minimum.

On the outside of the fitting, drilling location spots are placed at convenient points which facilitate the drilling of the solder feed holes.

The drilling location spots are located immediately above the solder feed channel [see illustration] so that when the solder is fed in, after heating with a blow torch, it is carried around and evenly distributed in all directions by capillary attraction. The tube is thus uniformly soldered to the fitting.

The tapered ends of the fitting which naturally produce a thin or feather edge, hasten cooling and act as a solder gate.

A JOINT MADE WITH MUELLER STREAMLINE FITTINGS TO MUELLER COPPER WATER TUBE IS ACTUALLY MUCH STRONGER THAN THE PIPE ITSELF.

A Mueller Copper Water Tube and Streamline Fitting Installation is easier to sell, makes a booster of your customer and adds to your reputation as a skilled mechanic.

It is now possible with the new Mueller Streamline fitting to make installations of copper pipe in the larger sizes.

Consult Your Nearest Jobber or Write Us Direct for Complete Information

Mueller Brass Co.

Port Huron, Mich.

Three Generations of Brass Making

Pat. Pending

Streamline Coupling Copper to Copper

Pat. Pending

Streamline Coupling Copper to Male I. P. S.

Pat. Pending

Streamline 90° Elbow Copper to Copper

Pat. Pending

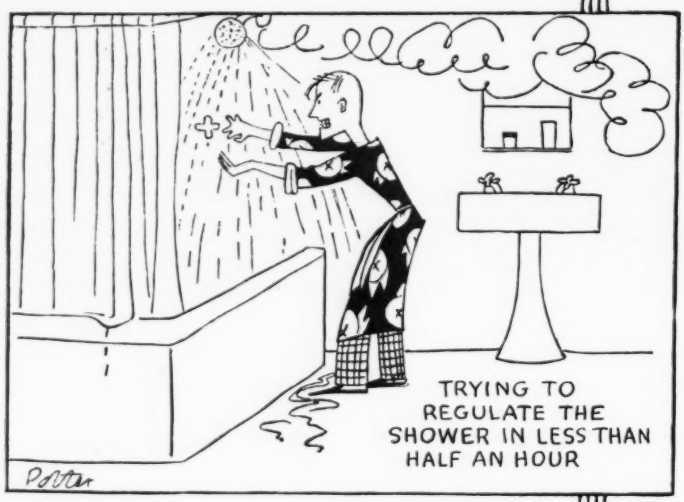
Streamline 90° Elbow Copper to Male I. P. S.

Pat. Pending

Streamline Tee Copper to Copper to Copper

MIXING · VALVES

Attempting the Impossible



Reprinted from The Chicago Daily News

—with the ordinary shower

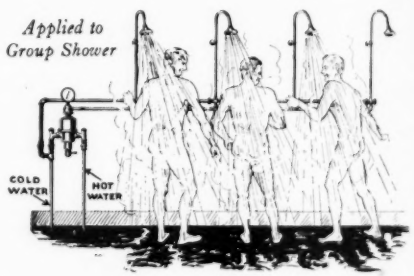
NO TIME is wasted trying to get water at the right temperature in a shower bath *controlled* by a Powers Shower Mixer. When you turn the handle to WARM, the water does not run *hot* one minute and *cold* the next, but remains where you want it until you change the position of the handle.

This is only one of the advantages of the Powers Shower Mixer fully described in our 22-page book. May we send you a copy?

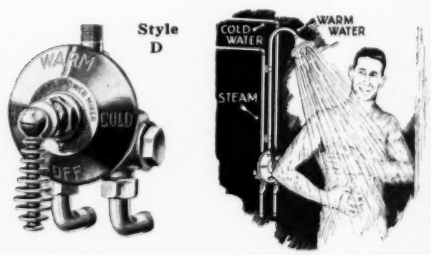
For QUICK — SAFE bathing
use
THE POWERS Shower Mixer

The Powers Thermostatic Water Controller

For group showers, baby baths, continuous flowing baths, car washing, etc. Scalding water cannot pass through this controller. Failure of cold water supply instantly shuts off the delivery. Simple in design. Rugged Construction. *Write for 12-page folder.*



The Powers Steam and Water Mixer



For shower baths, wash sinks, car washing, etc. Steam at 10 to 100 lbs. pressure and cold water at any pressure, piped to this mixer will give you COLD—WARM—or HOT water instantly. Positively Safe! No "shots" of hot or cold water—no noise or water hammer. *Write for Bulletin No. 2035.*

THE POWERS REGULATOR COMPANY

35 years of specialization in temperature control

General Eastern Office
137 East 46th St., New York City

General Offices and Factory
2720 Greenview Ave., Chicago, Ill.

Canadian Powers Regulator Co., Ltd.
106 Lombard St., Toronto, Ont.

Offices in 35 other cities — See your telephone directory

POWERS

THE CELEBRATED SKIP TOOTH DIE
(Genuine Nye)
REG. U. S. PAT. OFFICE

A Letter from Harry G. Nye

March 8, 1930.

To the Plumbers and Steamfitters of the U. S. A.

What We Need is More Pants Buttons

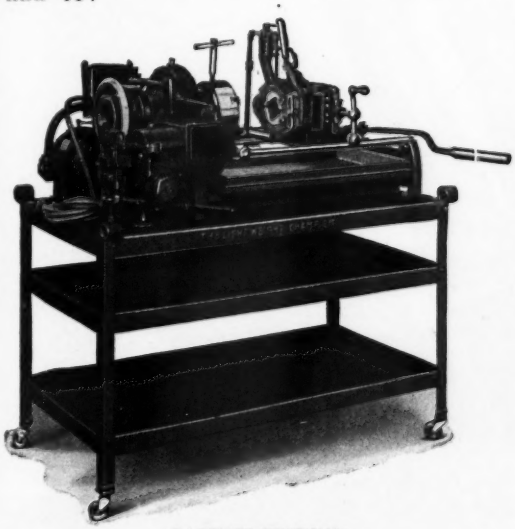
Fellow Citizens:

I see that women are taking up sewing again. Men have never quit—wild oats, I mean. But women are taking to sewing with an "e". You know, women have been getting along with hardly a stitch. I mean taking a stitch, of course. They have bought ready-made about everything they wore. That wasn't much. It was different when I was young, and it's a good thing.

In those days women made about everything they wore, and they wore about everything in those days. In those days a woman had a pair of trunks full of skirts. Now about all she has is a pair of trunks, and one skirt. Clothes are a good old custom, and I am glad to see them coming back.

My mother made about everything she wore, and made over about everything I wore. She could take an old suit of my father's, and by putting the front of the vest where the seat of the pants used to be, she could fix it over for me so you would hardly know, except for the soup stains. Joseph divided his coat among his brethren. Mother did the same with Pa's pants.

So women have gone back to sewing. I am glad to hear it, or will be when I am sure just what. What I want to know is whether it is doilies or buttons. Doilies are nice, but buttons are a necessity. Doilies are all right, but you can't get along without buttons. Although, at that, some of us have had to.



PATENTS PENDING

THE LIGHTWEIGHT CHAMPION

Threads—Cuts Off and Reams

Capacity ½ to 2 Inches

So, if women take up sewing, I hope they will take up sewing pants buttons first. It is what you might call an essential industry. I can't think of anything essentialer. This country will never make much progress if a man has to use one hand to hold up his pants all the while. And some men have had to do that, so I have heard.

Yes, sir, buttons are just as much standard equipment on a pair of pants as Nye tools are in a shop. If you are a plumber or a steamfitter, when that next big job comes along, don't get caught, metaphorically speaking, without Nye tools.

Yours truly,

Harry G. Nye

OTHERWISE KNOWN AS

THE NYE TOOL & MACHINE WORKS

4120-30 Fullerton Avenue :: Chicago, Ill.

Copyright 1930 by Harry G. Nye All rights reserved

THE CELEBRATED SKIP TOOTH DIE
(Genuine Nye)
REG. U. S. PAT. OFFICE

Ductility Increases the Usefulness of Steel Pipe
Republic Steel Pipe adapts itself to installations of a character employing bending, because it is sufficiently ductile without weakening its internal resistant strength.
Where the pipe is to be used for special bending, flanging, swedging, coiling or other severe forming operations, a special pipe for such purposes is determined in Republic Testing Laboratories . . . and the unusually high degree of ductility necessary, is assured by definite manufacturing processes controlled from ore to finished pipe. Thus proper ductility or "give in working" combines with "strength" in promoting more satisfactory, more lasting service.
RS
REPUBLIC
IRON & STEEL CO YOUNGSTOWN O
STEEL PIPE

Cold Radiators Heat Quickly

When your customers complain that they can't heat radiators at the end of the system, ten to one you'll trace the cause to a sluggish expansion tank or scale in the system. That's your time to recommend the more efficient Watts Hot Water House Heating Unit to increase the pressure. Then all the radiators will heat quickly. And, incidentally, you can make about 100% profit on the job.

Here are some of the super-features of the Watts Unit:

It automatically keeps the system full of water all the time, adding water as it is needed. Positively prevents excessive pressures, eliminating danger of explosions or cracked sections of boiler or radiators. Speeds up circulation and saves fuel. Has exceptionally large waterways to permit quick filling. A most important advantage is that the *entire*

WATTS House Heating Unit

is Listed as Standard by Underwriters Laboratories

No dirt can get into the system through the fine-screen bronze Strainer. Its strainer can not become clogged and collapse from water pressure as the design prevents sediment from piling up in front of it. It will not slow up the system.

The all-bronze Reducing Valve operates above the sediment line, preventing dirt from getting on the seat and holding it open. It has a non-corrosive phosphor bronze spring. The fabricated diaphragm gives unusually long service due to resiliency of the rubber. The genuine Jenkins disc closes against a beveled seat, which insures tight closing.

The heavy bronze Relief Valve has a 3-ply laminated diaphragm, two plies of phosphor bronze and one of Monel Metal, attached to a Jenkins Disc by a watertight cap and screw. No soldered parts. This diaphragm disc is on the ceiling of the valve away from the flow of water. There are no guide wings to stick or bind—no loose parts to get out of place.

Write for Catalog No. 38, or mail the coupon.

WATTS REGULATOR CO.

Makers of Water and Steam Regulating Devices Since 1874

249 Lowell St., Lawrence, Mass.

John G. Kelly, Inc., U. S. Sales Associates

210 E. 45th St., New York, N. Y.

Johnnie Moore, 1020 Lawrence Ave., Chicago, Ill.
Chicago Representative

W. H. Cunningham & Hill, Ltd., 269 W. Richmond St., Toronto, 2, Canada.

WATTS REGULATOR CO.,
249 Lowell St., Lawrence, Mass.

Without obligation, please send a copy of your Catalog No. 38.

Name.....

Address.....

Town..... State.....

Two Decades of Progress in Brass

Back in 1910 when the plumbing industry began to experience its first big demands for quality brass goods, the American Sanitary Mfg. Co. was organized.

It was organized to meet the new demand—the demand which was going to grow to such proportions that in two decades, American Brass Goods would be demanded for the nation's finest office buildings, hotels, stores, homes, etc. and for many of the finest sailing vessels.

Twenty years is a short time to build a reputation such as American has built. It could only be accomplished by the constant adherence to that first policy of meeting the demand for quality.

The two "AMERICAN" fixtures shown on this page are ***new*** additions to the American Line. They are the 2 inch waste and overflow with full 2 inch outlet directly under waste hole. For quick drain and for perfect service in all built-in bath tubs, demand the American 2 inch.

Extremely heavy cast parts throughout—a perfectly designed fixture which will meet every demand. Made with the cast elbow (above) or with wrought bend (below).

American Sanitary Mfg. Co.
Abingdon : : Illinois

Abnormal overload capacity

EDWARD R. SABIN CO.
HEATING CONTRACTORS
SABIN PRESSURE TANK HOT WATER HEATING SYSTEM
QUALITY GAS RANGES
4710-12 MARKET STREET
PHILADELPHIA

December 18, 1929.

Re: Conlyn Towers Apartment
Conlyn Ave & York Road,
Phila., Pa.

Pacific Steel Boiler Corporation
Waukegan, Illinois. -

Gentlemen:

I would like to call your attention to an accident which happened to the #8601 (18000 ft.) Pacific Steel Boiler which we recently installed in the above building.

For several days we were cleaning the system by discharging condensation into the sewer and supplying make-up feed with a Mc Donnel-Miller Water Feeder. For some reason, an attendant at the building shut off the feed supply valve. This would not have been serious except for the fact that the low water cut off switch on the oil burner was not connected and therefore could not operate. Consequently, all the water in the system was evaporated and the boiler heated to a cherry red, remaining so for some time before the accident was discovered and the burner shut off.

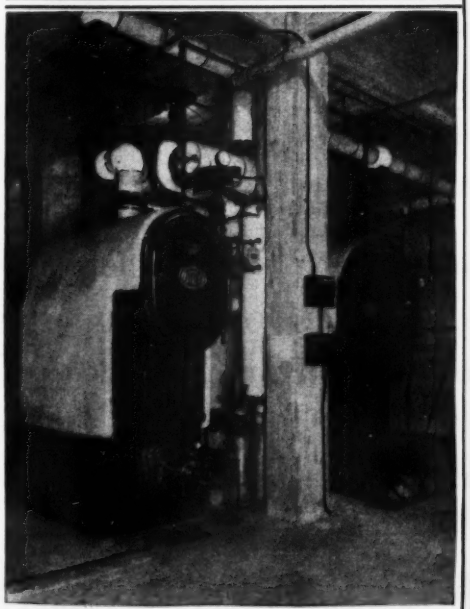
When first notified we assumed the boiler would be damaged beyond repair but were agreeably surprised when your local office reported that they would have the boiler in operation again inside of twenty-four hours, having found it only necessary to re-roll the tubes.

During the short time the boiler was out of commission a #8331 (4200 ft.) Pacific Steel Boiler which is used in the Summer for domestic water supply, kept the building comfortably warmed.

We are more than convinced of the ruggedness of your welded construction and conservative net ratings as evidenced by the performance of the smaller boiler during the period of the break down.

Very truly yours,
EDWARD R. SABIN COMPANY
Edward R Sabin
President

ERS:F



Pacific Steel Boilers in the Conlyn Towers Apartment, Philadelphia. When negligence put the 18000 ft. boiler out of commission, the 4200 ft. boiler used for summer hot water kept the building warm.

PACIFIC

Steel Heating Boilers and Capitol Radiators make a Logical Combination

WHEN a series of mishaps heated the 18,000 foot boiler in Conlyn Towers Apartment, Philadelphia, to a cherry red, the managers thought they were out of a boiler and in for a rush of tenant complaints.

They weren't. Within 24 hours, the big boiler was repaired and back in service.

In the interval, a 4,200 foot boiler, ordinarily used for summer domestic hot water, carried the whole heating load.

Yes, both boilers were Pacific Steel.

The letter tells the whole story. Read it.

PACIFIC STEEL BOILER CORPORATION
General Offices: Detroit, Michigan
Factories: Waukegan, Ill., Bristol, Pa.
Sales Offices in 58 Cities
Division of United States Radiator Corp., Detroit, Michigan

PACIFIC
STEEL HEATING BOILERS

WITHOUT

THE MOST COMPLETE POWER OPERATED PIPE EQUIPMENT

THE OSTER-WILLIAMS merger makes it possible for you to buy from one line every tool you need from the simple cutter and the handiest, most accurate small ratchet die stock—the Chip Chaser—to the largest, fastest, most economical production machine built—the Williams Rapiduction.

Every tool in this complete line has been designed and built with one objective in mind—to make more profits for you by helping you to do your job in less time, with less effort and at the same time more accurately and more economically.

THE OSTER MANUFACTURING CO.

JOINED FOR GREATER SERVICE

SALES OFFICE: 2077 EAST 61ST PLACE, CLEVELAND, OHIO

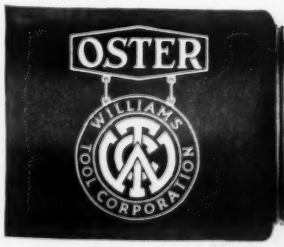
QUESTION

LINE OF HAND AND AND BOLT THREADING IN THE WORLD!

That is why these tools have so many added features not to be found on others.

Of equal importance, every tool in the Oster-Williams line is priced so that you may obtain all their additional features at a cost no greater than you pay for ordinary tools.

For better jobs at less cost to you, get acquainted with the most **complete** line of hand and power operated pipe and bolt threading and cutting-off machines in the world.

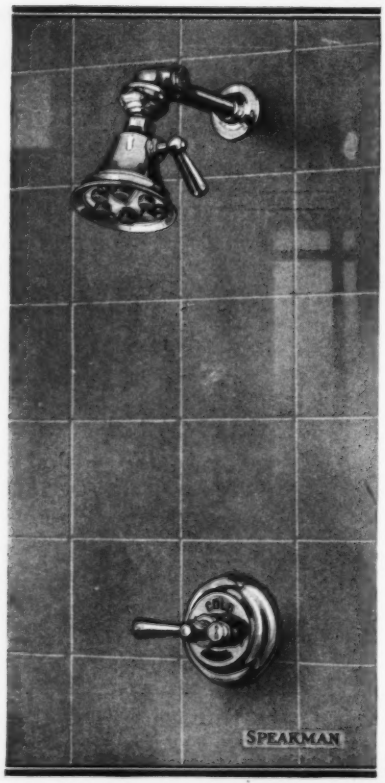


WILLIAMS TOOL CORPORATION

BRANCH OFFICES: BOSTON, NEW YORK, PHILADELPHIA, CHICAGO

K-3395—*New Self-Cleaning Shower Head*

You change the spray . . . when you turn the handle



This Speakman shower head sprays many different streams—can't stop up—fits any shower

IN the Speakman Anystream Self-Cleaning Shower Head every Master Plumber has an ideal new and replacement item. It fits all Speakman showers and any other make of shower. And it is such an improvement over ordinary shower heads that everybody likes it.

Turn the lever at the side and you change the spray—fine, needle shower, medium spray, a single heavy stream. When the plungers are all the way out the water flows through in a heavy douche that forces out every last bit of dirt and scale. It can't stop up. There is no after-drip.

The construction of this head lives up to what you would expect from Speakman. Heavy and husky enough to last a lifetime. Beautifully machined, with good, clean-cut threads. Finished with a heavy, permanent coat of bright Speakman chromium plate. Speakman Company, Wilmington, Del.

K-2603-M—*Speakman Metaline Mixometer Shower* This is only one of many complete Speakman showers for all types of installations. Mixometer with metal wall plate and metal handle. Straight arm with metal escutcheon, elbow ball joint and screw-driver stop for regulating water pressure. With Self-Cleaning, Anystream Shower Head. Size ½ inch.

SPEAKMAN
SHOWERS & FIXTURES

FAMOUS FIGHTERS

MUSKELLUNGE

(American Game Fish)

The "musky" or great pike is one of the highest prizes for sportsmen. Because he is such a superb fighter—swift, strong and fierce—the angler who vanquishes him must also be a great fighter. The muskellunge is a magnificent fish. He is the largest of his family and most to be feared as a predatory force in American fresh waters. He ranges from 2½ to 5½ feet in length and often weighs up to 100 lbs. As is the case with all famous fighters, the superiority of the "musky" rests upon certain fighting qualities. Without these he would be no better than any other fish.

Why Weil-McLain Boilers *are famous fighters*

Weil-McLain Boilers have fighting features, too! These features not only fight fuel and heat waste for home owners, but they are easily demonstrated. They are good reasons why Weil-McLain Boilers are so easy to sell.

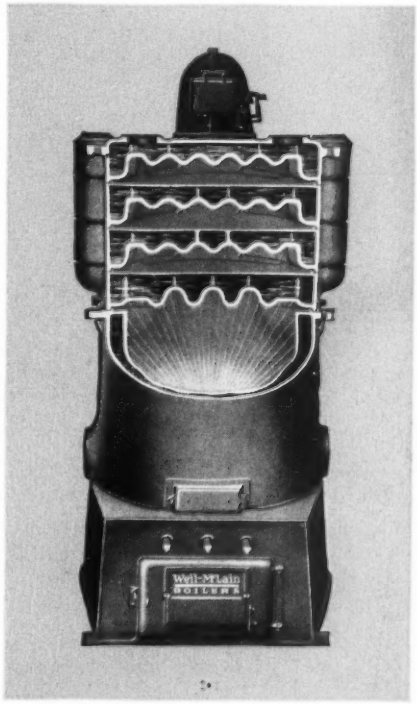
Fuel-saving corrugations like this ~~~

Weil-McLain Round Boilers, for example, deliver more heat and save fuel, because all vital heat-absorbing surfaces are corrugated like this ~~~ instead of flat like this ———. You can readily see that corrugations crowd 30 to 40 per cent more heating surface into the same space.

Balanced back-and-forth fire travel

More heat is actually utilized in Weil-McLain Boilers because Weil-McLain fire travel is not only back and forth but it is *balanced.* Variations in the rate of operation, due to varying heat demands, do not alter the long, balanced, back-and-forth flow of gases through the flues.

In the complete line of Weil-McLain Boilers you will find scientific principles of design that enable these boilers to fight fuel waste and deliver more heat. The line includes Round Type, Jacketed, Square, Self-feed and Smokeless Boilers. Also Weil-McLain "Cameo" Radiators.



WEIL-McLAIN COMPANY, General Office: Chicago
Boiler Plant and Offices: Michigan City, Ind.
Radiator Plant and Offices: Erie, Pa.

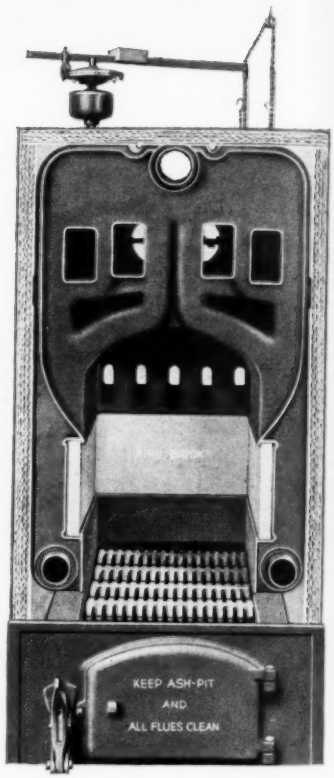
Jobbing distributors with local stocks in most jobbing centers

Weil-McLain
SCIENTIFIC COMBUSTION
BOILERS
fight fuel waste and deliver more heat

© 1930, W-McL.

If you'll make just *one point* clear to your prospects

. . . *the New Smith "16" will sell itself*



SMITH "16" SALES FEATURES

The New Smith "16" has everything that makes for easy selling and satisfied customers — the built-in experience of 75 years.

EFFICIENCY FEATURES OF NEW SMITH "16"

Abundant Fuel Space
Extra Large Combustion Space
Fire Brick Lined Fire Pot
Auxiliary Air Supply
Fire Surface Galore
Especially Adapted for Oil and Gas
Air-Cell Insulation for Jacketed Boilers

THAT point is fire surface. Tell your prospect he can heat his house either with scanty fire surface and lots of fuel, or with plenty of fire surface and much less fuel.

Remind him that he buys his boiler only once whereas he buys fuel every year, and that what he can save once on his boiler is no more than he can save *every year* on his fuel. He soon sees the point that the real saving can be made in fuel and that he should buy a boiler with plenty of fire surface—a boiler like the New Smith "16" which has more fire surface than any boiler of equal grate area.

The full story of this important sales feature is given in our new book, "The Smith 16," a copy of which we will gladly send you upon request, free of charge and without obligation. Address, The H. B. Smith Co., Dept. A-71, Westfield, Mass.

THE H·B·SMITH
BOILERS & RADIATORS
Used in fine homes and buildings since 1860

The H. B. Smith Boilers for steam, hot water and vapor heating; radiators; and hot water supply boilers; for every type and size of private home, office building, factory and public building.

SALES OFFICES AND WAREHOUSES:

NEW YORK 10 E. 41st St. | PHILADELPHIA 2209 Chestnut St. | BOSTON 640 Main St., Cambridge | CLEVELAND 1108 Webster Ave., S. E.

WESTFIELD, MASS.

Residence Group Heated by a Webster Type "R" System of Steam Heating

Another Opportunity for Preferred Business

This group of small houses is heated by a central plant Webster Type "R" System of Steam Heating—a practice growing steadily in favor. The arrangement relieves the individual occupant from the entire care of the boiler—a strong talking point for real estate salesmen. Though the Type "R" System is highly engineered, its installation is simple and easy. Its operation is also simple and does not require the services of a skilled operating engineer.

The Type "R" System is well adapted to small groups of residences such as this. Experience has proved it to be economical and completely satisfactory. The safe and sound principle of gravity operation with positive equalization of pressure *plus* the dependable performance of Webster equipment make the Type "R" System remarkably free from trouble and complaints.

When bidding on small house groups with central heat, suggest the Webster Type "R" System. Get in touch with a steam heating specialist in the nearest Webster Branch Office. He will help you in developing this kind of *preferred* business.

-since 1888
Webster
Systems of
Steam Heating

The Webster Steam Heating Specialist in your vicinity can probably help you in developing *preferred* business with Webster Type "R" Systems. Get in touch with him.

WARREN WEBSTER & COMPANY
CAMDEN, NEW JERSEY
Pioneers of the Vacuum System of Steam Heating
Branches in 52 principal U. S. Cities
In Canada—Darling Bros., Ltd., Montreal

a R-15HC

WARREN WEBSTER & COMPANY, Camden, New Jersey
Please mail Bulletin B-600, describing the Webster Type "R" System of Steam Heating to

Name..... Street..... City.....

DE-3-30

TWO IMPORTANT ANNOUNCEMENTS

Of Vital Interest to The Entire Plumbing Industry

Majestic Flush Valve—Diaphragm Type

Majestic Flush Valve

Medium Priced

Diaphragm Type

FOLLOWING the motto of "Buick," a member of the General Motors family, for whom we have great respect, "When better flush valves are made, the Imperial Brass Mfg. Company will make them."

We were the first to bring out an art design flush valve, and the original Watrous flush valve as made for many years by us has always contained a simple mechanism for regulating the amount of water used for flushing, and an efficient self-cleansing by-pass feature.

We now offer the new Majestic flush valve illustrated herewith, frankly presented for competitive purposes. But we wish to emphasize the fact that ingenuity, born of over forty years' experience in brass manufacturing, has enabled us to produce this new valve in the time-proven, successful diaphragm-type; it has the same efficient regulating and self-cleansing features as the original flush valve.

The Imperial Brass Mfg. Company enjoys the highest commercial rating in Dun and Bradstreet, and all Imperial products are backed by an unqualified guarantee of satisfactory operation.

Chromium Plating

Since the first inception of the process of chromium plating, we have continually experimented until today we are leaders in making quality chromium plate.

We firmly believe that this is the most durable finish for plumbing fixtures. We now announce that we are furnishing chromium plate finish for all types of our flush valves at *the same price* as nickel plate finish.

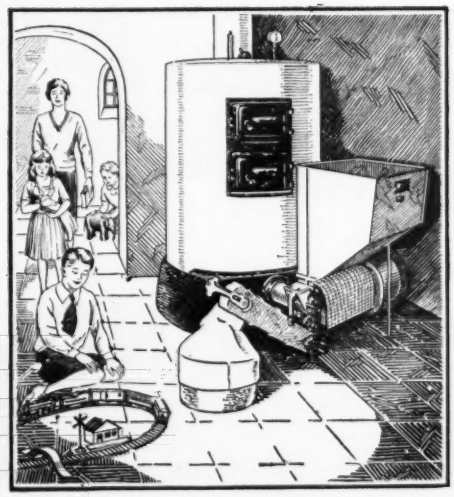
THE IMPERIAL BRASS MANUFACTURING COMPANY

1231 West Harrison Street **CHICAGO**

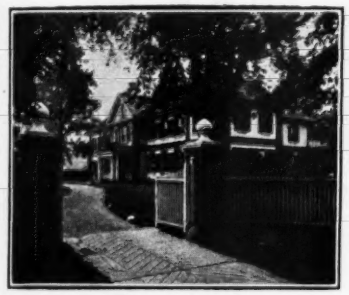
BRANCH SALES OFFICES IN ALL PRINCIPAL CITIES

MODERN AUTOMATIC HOME HEAT *for* EVERYBODY

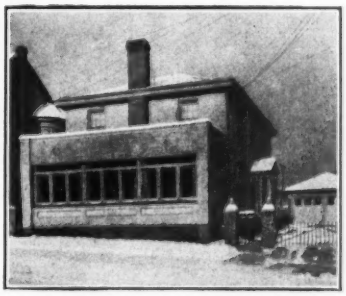
NO SMOKE
NO SMUDGE
NO SOOT
NO ODOR
NO DANGER



MAKES MAGAZINE
BOILERS AUTOMATIC
SAVES FROM 40
TO 80 PERCENT
OVER OIL OR GAS



For Those Who Can Afford the Best.
Also Within the Price Range
of the Modest Home



Readily Installed in any Heating System

(Steam — Vapor — Hot Water — Warm Air)

The ELECTRIC FURNACE-MAN makes PENNSYLVANIA ANTHRACITE AUTOMATIC. No longer is it necessary to resort to "substitute" fuels to obtain the luxuries of automatic heating.

The ELECTRIC FURNACE-MAN is easily installed in YOUR PRESENT FURNACE OR BOILER.

The ELECTRIC FURNACE-MAN, by automatically feeding just the right amount of coal with just the right amount of air, MAINTAINS A CONTINUOUS FIRE in proportion to your heating requirements, no matter what the outside temperature may be.

The ELECTRIC FURNACE-MAN automatically REMOVES THE ASH to a sealed container on the floor level outside the furnace or boiler.

NO DRAFTS TO REGULATE — NO GRATES TO SHAKE

CLEAN — SAFE — ECONOMICAL — ACTUALLY REDUCES HEATING COSTS

MORE THAN 10,000 SATISFIED USERS

DEALERS IN OVER 300 CITIES

SEE INTERESTING DISPLAY AT LOCAL DEALERS

The Electric Furnace-Man

Endorsed by Anthracite Operators Conference
A Billion Dollar Industry

AUTOMATIC ANTHRACITE HEAT

(Patented Automatic Coal Burner)
Product of Domestic Stoker Company
7 Dey Street, New York

Millions of Tiny Barriers say—

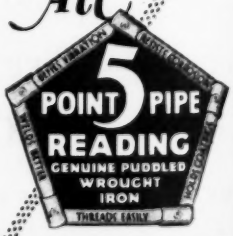
RUST SHALL NOT PASS

Why doesn't rust eat into Reading Genuine Puddled Wrought Iron Pipe, as it does into ordinary pipe? A microscope will tell you—and more than eighty years of experience will furnish the proof! For, throughout the structure of Reading 5-Point Pipe, millions of silicious barriers say "Stop" to corrosion.

Puddling—the time-tested way of making the original, Genuine Puddled Wrought Iron—distributes this silicious element so uniformly that rust can't find a loophole. That's why it is important to insist on getting Reading Genuine Puddled Wrought Iron, known for generations. Our name and indented spiral mark protect you.

Easier to work with, easier to cut and to thread—that's what plumbing and heating contractors say about Reading 5-Point Pipe! You will lower your labor costs and increase your profits by installing this dependable, moderately priced pipe.

For Your Protection This Indented Spiral Forever Marks All



READING IRON COMPANY, Reading, Pennsylvania

Atlanta - Baltimore - Cleveland - New York - Philadelphia
Boston - Cincinnati - St. Louis - Chicago - New Orleans
Buffalo - Houston - Tulsa - Seattle - San Francisco
Detroit - Pittsburgh - Los Angeles - Kansas City

GENUINE PUDDLED WROUGHT IRON
READING PIPE
DIAMETERS RANGING FROM ⅛ TO 20 INCHES

Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Wrought Iron

Hammering

from 2900-3300 blows per minute

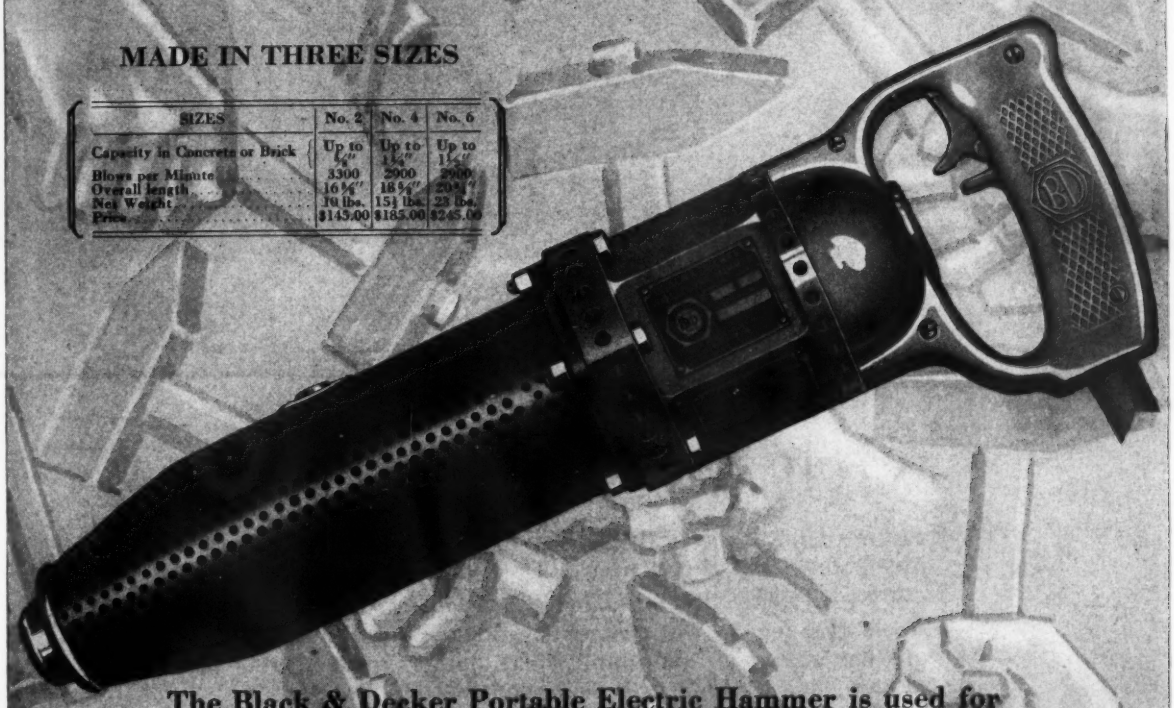
with the

BLACK & DECKER

Portable Electric Hammer

MADE IN THREE SIZES

SIZES	No. 2	No. 4	No. 6
Capacity in Concrete or Brick	Up to ⅝"	Up to 1⅛"	Up to 1½"
Blows per Minute	3300	2900	2900
Overall length	16⅝"	18¾"	20¾"
Net Weight	10 lbs.	15½ lbs.	23 lbs.
Price	$145.00	$185.00	$245.00



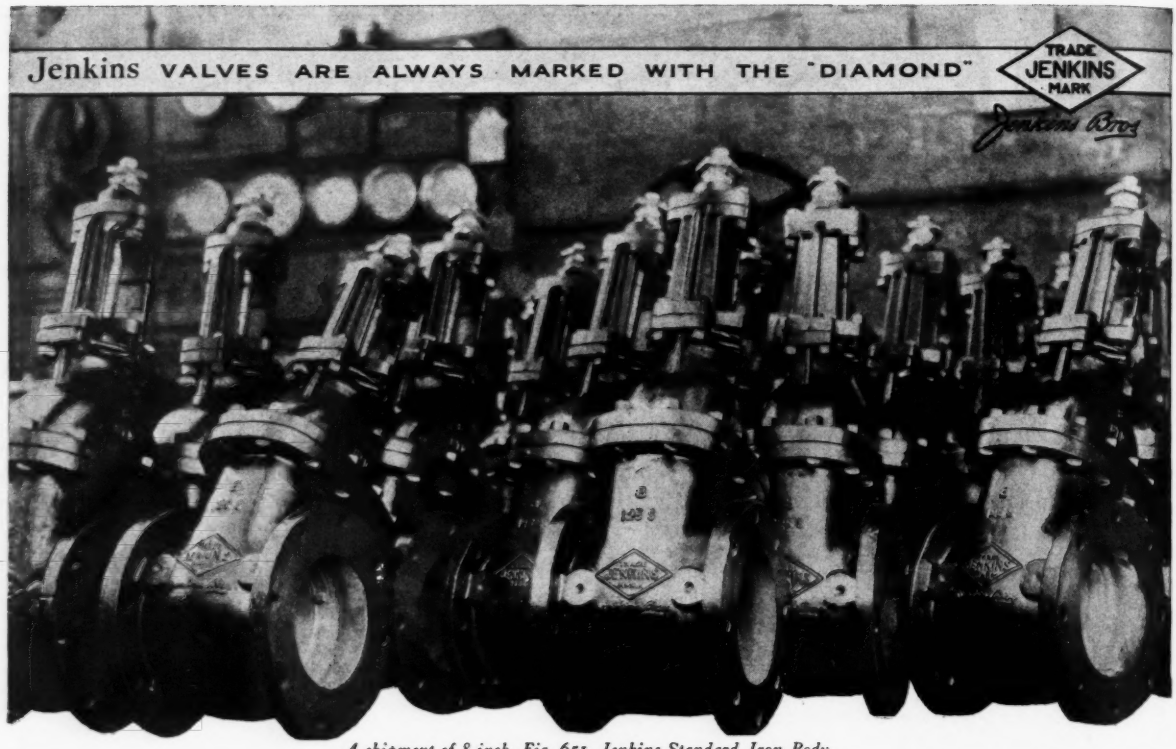
The Black & Decker Portable Electric Hammer is used for driving certain types of tools where hammer action is desired, such as star drills, chipping chisels, wood-working tools, bull points, etc.

It is made in three sizes, the No. 2, No. 4 and No. 6, and will drill holes in brick or concrete from 0 to 1½ inches in diameter. These hammers are unusually light in weight, strong and sturdy, and each is a complete unit in itself—no auxiliary apparatus being required. They can be plugged into any electric light socket, ready for use.

Write for catalog describing in detail the complete line of Black & Decker Portable Electric Tools

The **BLACK & DECKER MFG. CO.**

Toronto, Ontario, Canada — TOWSON, MARYLAND — Slough, Bucks, England



A shipment of 8 inch, Fig. 651, Jenkins Standard Iron Body Gate Valves, with outside screw and yoke and rising spindle.

Build business with Jenkins Valves

From small bronze valves that fit in your fist to huge iron bodies like those shown . . . whatever the job requires, it pays to put in a Jenkins.

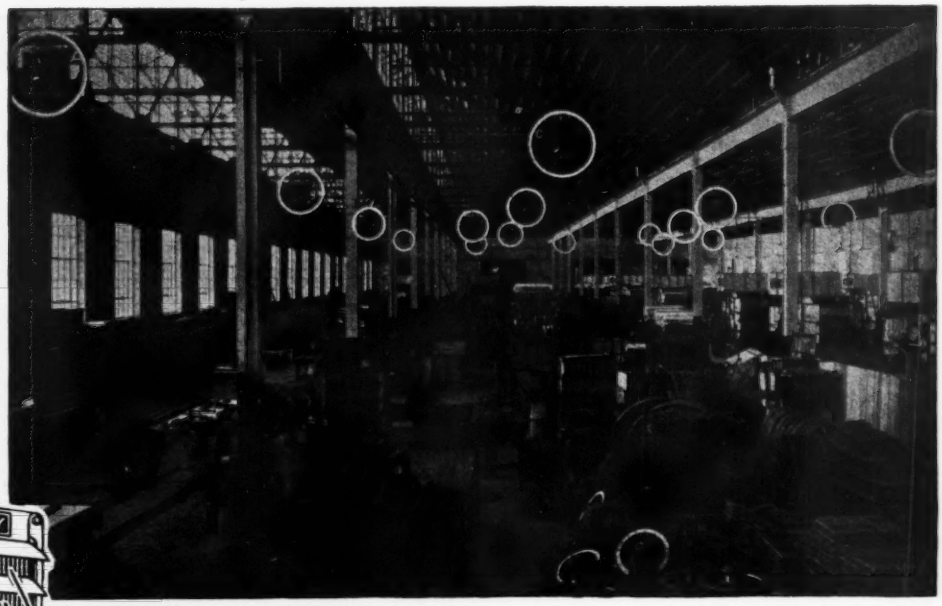
To install Jenkins Valves is to add the final touch of quality to good plumbing. It builds owner satisfaction and strengthens the contractor's reputation.

For over 65 years the name of Jenkins has been accepted as a guide to valve performance that is long and efficient. Jenkins are obtainable through supply houses everywhere.

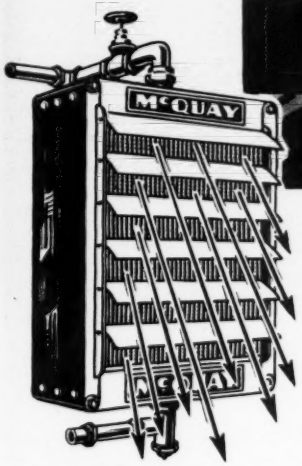
JENKINS BROS.

80 White Street, New York, N.Y. 133 No. Seventh Street, Philadelphia, Pa.
524 Atlantic Avenue, Boston, Mass. 646 Washington Boulevard, Chicago, Ill.
JENKINS BROS., Limited, Montreal, Canada; London, England
Factories: Bridgeport, Conn., Elizabeth, N. J.; Montreal, Canada

Jenkins
VALVES
Since 1864



A typical installation of McQuay Unit Heaters. If old-style heating methods were used here, most of the heat would be wasted up near the roof.



All Copper Heating Element

Tubes of the heating element are of heavy gauge copper, welded into a copper header—giving equal expansion and contraction, and eliminating chance of leaks that occur when tubes and headers are of different materials.

A particular McQuay feature is that *after* the heating unit is completely welded it is dipped into a tin bath, coating it both inside and out. This gives the tubes a glassy smoothness, preventing clogging; and also prevents attacks from impure water.

The motor and fan are supported, according to a McQuay idea, in such a way as to take care of vibration and make them noiseless.

Stop Wasting Heat

McQuay Unit Heaters force the warmed air down into the working areas—where heat is needed. Unlike old-time methods little, if any, heat is wasted in the upper unused portions. Fuel bills are less — and every workman is comfortably warmed.

Even on a cold morning, after the boiler has been banked all night, an entire building can be comfortably heated in a very short time. For, a *few seconds after the heat and fan are turned on a flood of heated air is circulating over the entire floor.* And it keeps on circulating until the heat is turned off.

Each unit can be individually controlled so that the heat is easily turned off in idle parts of a factory.

Quickly and easily installed in any building, McQuay Units are made in capacities equivalent to from 50 to 2000 sq. ft. of cast iron radiation. They are excellent supplementary equipment to present inadequate heating systems. McQuay Products are sold *only* to recognized heating contractors. Ask for prices and discounts.

McQUAY
UNIT HEATERS

McQUAY RADIATOR CORPORATION
General Offices: 35 East Wacker Drive, Chicago

Again!

NATIONAL COPPER-STEEL PIPE...

for one of New York's finest—the News Building—another important addition to the Grand Central Zone. In this area is the finest group of commercial buildings in the world—including the Chrysler Building, Graybar Building, Postum Building, New York Central Building, Park Lane Hotel, Roosevelt Hotel, The Barclay, the Ambassador, the Lexington and the News . . . all imposing in appearance—substantial in structure . . . all contain NATIONAL Pipe.

The News Building fits in well. Its graceful lines are backed by substantial construction . . . especially the mechanical equipment. Here, time-tested and proven materials were specified by famed architects, engineers and contractors. Naturally, NATIONAL Pipe was chosen for the major part of the tubular requirements and, again, as in the Lexington Hotel of above group, NATIONAL Copper-Steel Pipe was used for the soil, waste, vent lines and rain leaders to resist atmospheric corrosion. NATIONAL Copper-Steel Pipe was also used in part of the drainage system of the Chrysler Building in this area. For complete information send for literature describing—

NATIONAL COPPER-STEEL PIPE
The Original Copper-Steel Pipe

NEWS BUILDING, New York City
Associate Architects: John Mead Howells, New York City; Raymond M. Hood, New York City
General Contractor: Hegeman-Harris Company, New York City
Heating & Ventilating Engineers: Jaros & Baum, New York City
Sanitary Engineer: A. E. Hansen, New York City
Engineers for Plant: Lockwood, Greene & Company, New York City
Plumbing Contractor: John McMillan Company, New York City
Heating Contractor: Alvord & Swift, New York City

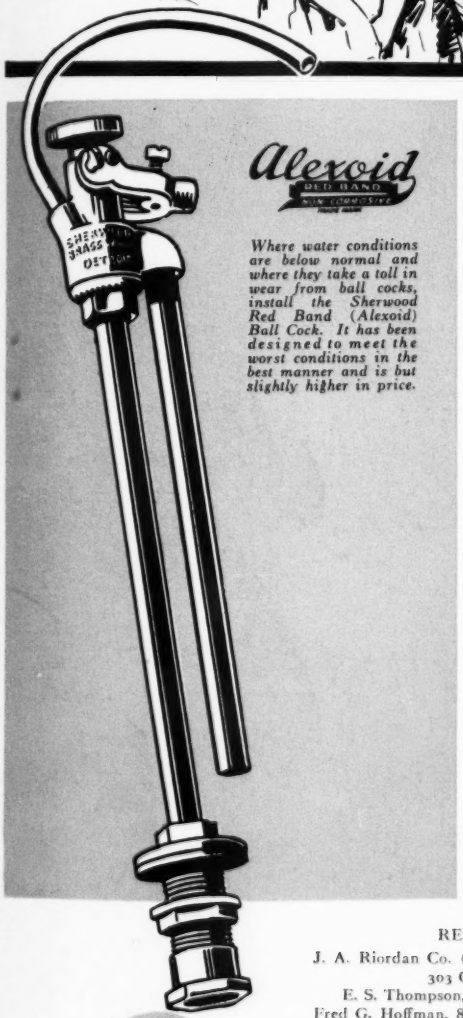
NATIONAL TUBE COMPANY
Frick Building, Pittsburgh, Pa.
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES:

American Bridge Company
American Sheet and Tin Plate Company
American Steel and Wire Company
Carnegie Steel Company
Cyclone Fence Company
Federal Shipbuilding and Dry Dock Company
Illinois Steel Company
Minnesota Steel Company
National Tube Company
The Lorain Steel Company
Tennessee Coal, Iron & R. R. Company
Universal Portland Cement Company

Pacific Coast Distributors—United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle, Honolulu. *Export Distributors*—United States Steel Products Company, New York City

WHISTLES --- GURGLES --- LEAKS



Alexoid RED BAND

Where water conditions are below normal and where they take a toll in wear from ball cocks, install the Sherwood Red Band (Alexoid) Ball Cock. It has been designed to meet the worst conditions in the best manner and is but slightly higher in price.

They're More than Conversation

Bathrooms, no matter how beautiful can well be a source of embarrassment to your customer if the ball cock in the tank is one that whistles, gurgles or leaks.

If you could listen in on the conversation of your customers, after the guests have gone, some evening, you'd discover that whistles, gurgles and leaks are more than conversation—they're *real* problems in the home.

You'd find that if you talked Sherwood Ball Cocks to these customers, they'd buy in a minute and they'd listen with a willing ear to any other suggestions you might have for improving their plumbing equipment.

Sherwood Ball Cocks close against any city water pressure—and embarrassing, disturbing noises are never experienced. They are furnished in any size shank desired.

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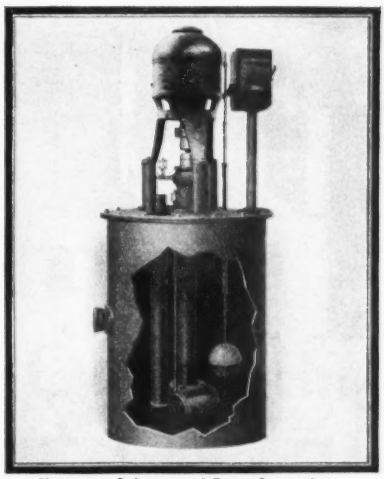
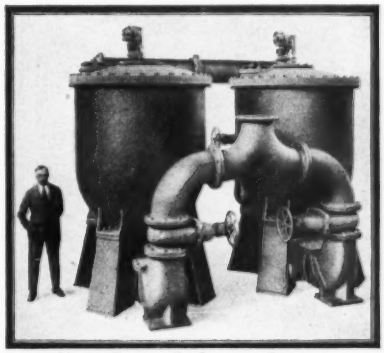
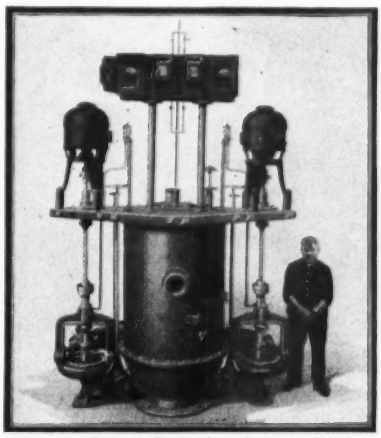


Yeomans Submerged Type Screenless Sewage Ejector



Shone Pneumatic Sewage Ejectors



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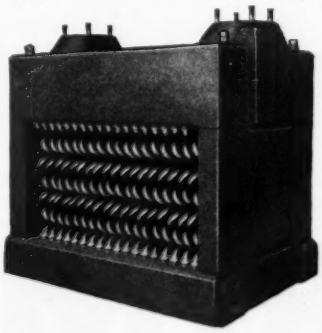

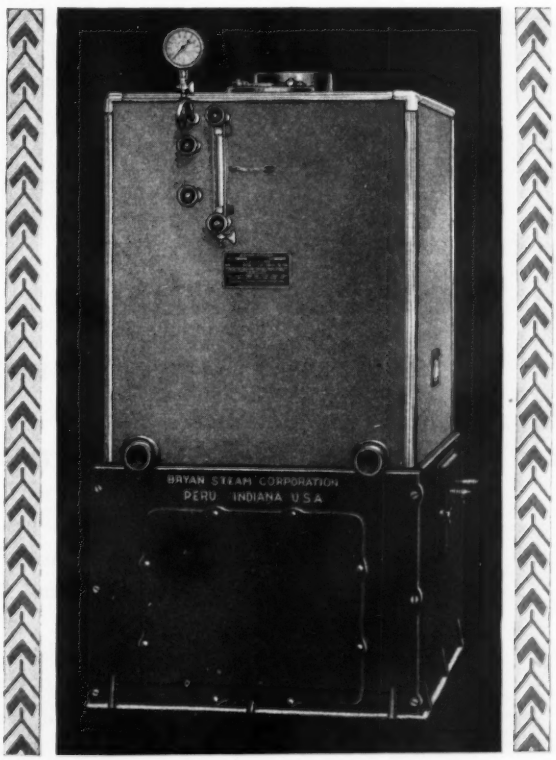

(LEFT)—THE COPPER-TUBE ASSEMBLY—*Contrast this maze of copper-tubes through which every heat unit must pass in the Bryan Boiler, with the bulky, heavy cast-iron sections of the conventional coal-burning type of boiler. With Bryan there is no "laning" or stratification of the hot gases. The heat is broken up, time after time, by rushing head-on into the copper-tubes, which are capable of absorbing and transmitting heat more than seven times as fast as a cast-iron section of equal size.*

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Strong Arms ~ Strong Wrenches

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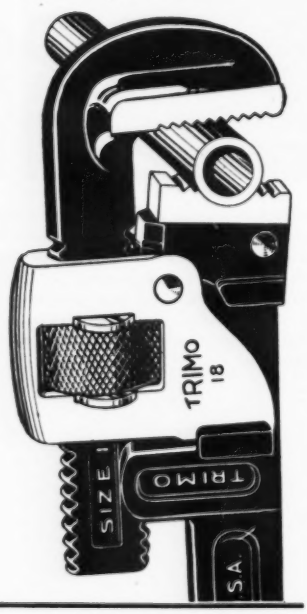

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At leading plumbing supply and hardware dealers.

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All Steel for Strength

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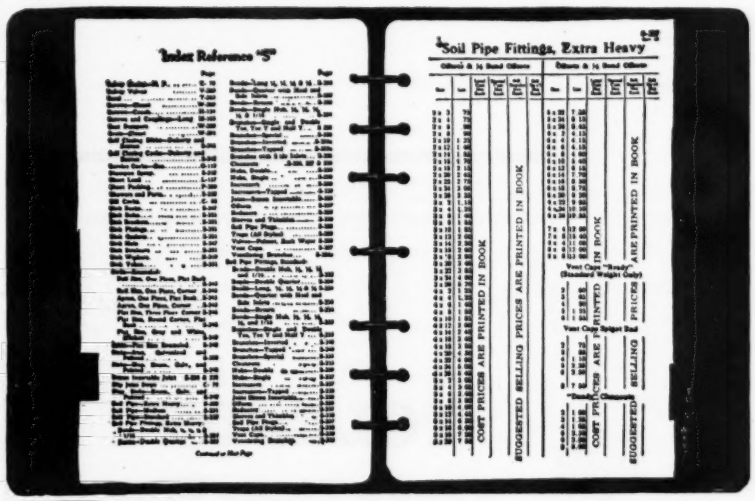
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DOMESTIC ENGINEERING

PLUMBING AND HEATING CONTRACTING AND MERCHANDISING

Observations

What You Put In

There are a number of phrases which one hears used by speakers which we come to take for granted. We've heard them so often that only the bludgeon of circumstances awakens us to the truth of them now and then.

For example, how often have you heard speakers say that the interests of manufacturer, wholesaler and retailer are identical? We applaud the statement politely—and forget it. But the trade practice conferences are the result of a recognition that the thing is true—that if one branch of the industry seeks to profit by short-sighted practices, every other branch will suffer; that if one branch of the industry is so lacking in good management that it can not make a profit, the other branches will shortly be in the same boat.

Perhaps the statement one hears most frequently concerns association work. You get out of your association, say speakers, just what you put in. Again we applaud politely—and forget it. Is there anything in that statement? Or is it merely one of those things which sound well in a speech?

What Price Associations?

It is not impossible to show how personal efforts in association work give a man a better grasp of the problems confronting him in his own business. To quote the stories by Milt Marvels, which were published in DOMESTIC ENGINEERING before the "Plumbing and Heating Merchandising" feature section was introduced: "The man who spends one hour thinking about the problems of his industry spends two hours thinking about the problems of his own business." A man can not think about the broader problems of the industry, as faced by its association members, without gaining insight into the things he faces daily.

But let us forget the matter of personal effort. Let us admit that a man who is busy managing his own business has little time to give to association affairs. We will assume that his contribution to the association is in the form of funds so that a paid secretary may be secured to work continuously on the problems which lie in the field of association work.

The average member of the association which is maintaining an executive secretary can cite proofs of the value of his investment. For instance, consider the report rendered at the recent Illinois state convention by one of the executive secretaries, of which the state has between fifteen and twenty.

In reporting the Illinois convention, DOMESTIC ENGINEERING gave special attention to this report. The secretary in question had developed a method of allotting overhead for each phase of the business, with the result that the management could see exactly where money was made and where lost; making the point that it was a mistake to think that an average overhead was correct for every type of business a firm

A Paying Investment

might do. He showed how one department might be carrying a department which was actually losing money and was a burden to other and more profitable departments.

The interest shown by readers in this part of the report shows that the secretary's findings were of the greatest practical value. It was a piece of work which ought to be available to the entire industry. Yet if one man had worked it out for himself, it might never have had a wider publicity. But, supported by funds contributed by members of the association, this secretary has developed this system of cost finding, among other things, of course, which it is hoped will be adopted by every shop in the group.

There is a direct return for what was "put in" the association. Other results were reported—co-operative work between nearby cities and towns in building up associations and breaking down the sort of irritating circumstances which may arise where men go from an unorganized town into an organized town and create difficulties. Not that they intend to; but they lack the viewpoint which the active association is able to foster as to the value of sound management and selling policies.

If a man is active in the support of his association, either in the way of personal effort, or by way of helping bear the financial burden, what he can get out of his association is just this: He can put in his problems and get out their solutions.

The association, properly defined, should mean co-operation among the contractors of a town or city, the willingness to assist in meeting these problems and working them out to the best interests of the members of the association, as well as the industry at large. The contractor follows the wise course when he gives his best efforts to the support of his association.

Alert Merchandising

In these modern days, the directions in which the plumbing and heating contractor can look for business are increasing. Some of the members of the industry have come to look for special selling opportunities in the industrial field. Recently a member of the staff had the pleasure of visiting a number of oil burner installations made by a firm prominent in plumbing and heating circles. This firm does not attempt to go after residential business for the oil burner it handles. Its entire business is made up of installations in large buildings, factories, hospitals—one is in the plant of a company manufacturing products handled by the heating contractor.

Sales Opportunities

Another contractor watches his opportunity for the sale of unit heaters in factories where the radiation originally installed does not meet the peculiar conditions of rooms in which work must be carried on at a fairly even temperature. What seem to the owners of the factory to be production problems are proved by this contractor really to be heating problems which, when met, correct troublesome conditions.

Still another contractor tells of his experience with a dairy. Called in to take care of lines clogged by lime, he suggested water softeners as the solution. This dairy used five tons of soap powder a year in the process of washing bottles, equipment, etc. The line from the steam header for sterilizing bottles gradually became filled with lime. No doubt the condition had been there for years. This contractor recognized the sales opportunity. He has cut down the bill for soap by delivering soft water; and a battery of three water softeners, increasing in size from the first one installed, functions to furnish water which will not lime up the piping and which does not require so great an amount of soap.

These men are what we have called "sales-minded." They recognize a sales opportunity, and they know how to present the needed product in terms of the prospect's own interests. The dairy saves substantially on something in the neighborhood of two tons of soap powders and is freed from the frequent trouble with lime-clogged piping. These are the arguments which the contractor presented as favoring the water softener first installed; and as they worked out in practice with that installation, two more went in. They apply the familiar epigram attributed to Caesar: they come, they see and they conquer—and their conquest takes the form of increased sales.

To the Prospect's Advantage

The Convention Season

The season for conventions is with us again. It is obvious, from what was said at the recent conference of association officials in Chicago that there is a stronger demand this year that conventions yield practical value to those attending.

Naturally what a man gets out of a convention depends on what he goes for. He wants business information; he wants contact with old friends; he wants some social activities. But even the last two things can be made to produce practical value.

If every man who attends a convention would go with one or two definite questions in his mind—questions which he really tries to have answered—his attendance at the convention will be repaid. It may be that his questions can be answered from the floor. But if that opportunity does not arise, he will meet and talk with many men. Let him keep his question in mind and seek in these personal contacts to add to the information developed in the meetings.

Convention Information

We feel that the need for conventions is obvious; whether the convention is of practical value is a matter within the control of the members and their officers.

Turning Difficulties *to* Advantage

Springs which flooded basement of Hawaiian building utilized as water supply

By GEORGE MELLEN

THE ability of the plumbing engineer to turn to advantage many of the obstacles met in his work was demonstrated recently in a very practical manner in the construction of a four-story office building for Alexander & Baldwin, sugar factors and commercial agents, Honolulu, Hawaii.

When the excavators dug out for the basement of the building described in this article, they encountered fifteen flowing springs. As a matter of fact, the main part of the basement was excavated to a depth of 4 ft. below sea level and the engine room was made 10 ft. below that. When the structural difficulties were overcome, the plumbing contractor was called in to utilize this source of water in a dual water supply system, one part of which was to supply city water for drinking, etc., and the other part being designed to flush toilets, sprinkle lawns and supply service for the shower baths. In addition, one spring was capped and connected to a fire plug for the purpose of augmenting the water supply for fire fighting in the immediate vicinity.

Unique features in ventilating and cooling are also discussed.

At the time of the excavation of the basement, below sea level, the contractors called the plumbing engineer, for no end of trouble was being caused by many springs which were gushing fresh and salt water, flooding the basement excavation. But when the building was opened, September 30, 1929, non-technical visitors and engineers alike were able to see, discuss and study a plumbing system part of which was based on the same springs which rather disrupted work at the excavation stage.

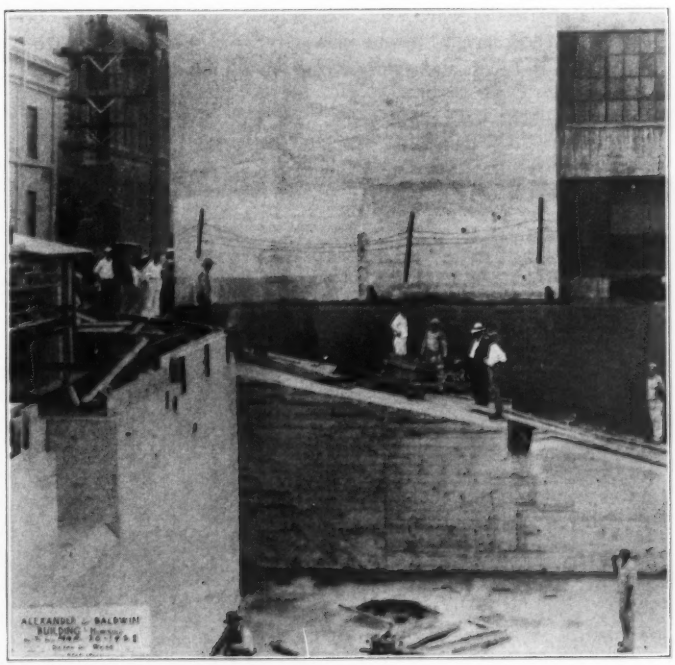
Fifteen springs, varying in size and salt content, were tapped by the basement excavators. The result was a 48-hour stretch of continuous concrete pouring, some 14,000 sq. ft. of 20-in. concrete slab being poured in one piece to obviate any possibility of breaks where one pour would end and another begin. Such breaks would allow water to seep into the basement, which is some four feet below sea level, while the machine and engine room is 10 ft. lower than that. The springs had sufficient head to make it necessary to operate three 6-inch pumps night and day during the excavation and foundation work.

Plumbing Contractor Called on to Turn Obstacle Into an Advantage

So far, these fifteen springs had proved themselves nothing but an obstacle to the progress of the building—a disadvantage which cost considerable in time, money and labor to overcome. To turn this obstacle into an advantage was the next step, and the plumbing layout of the completed building shows how well this was accomplished.

A dual water system functions throughout the entire building. One system draws its water from the city mains, and the other, which is by no means an auxiliary system, utilizes one of the largest of the springs uncovered in the excavation. The basement, incidentally, was dug out of the coral which underlies most of Honolulu, and where actual springs were not bubbling to the surface and above, the porosity of the coral allowed both fresh and brackish water to seep through.

The spring selected to play an important part in the plumbing of the new building was a fresh water spring from the artesian basin about a thousand feet below the surface, from which Honolulu draws its water supply. The possibility of future contamination from salt water seepage at the surface, as the building is only a block from the sea, influenced the engineers in their decision to use this water only where a slight salt content would not matter. As a result, the shower baths, sprinkling and irrigation system for the lawn and



Ramp to basement garage, basement walls being waterproofed

gardens, and the flushing system for the toilets are all hooked up to the 5,000-gallon tank in the attic supplied by this spring.

The spring has sufficient head to prime the 10-hp. booster pump in the engine room, which is controlled by automatic float valves in the attic tank. Additional protection against a too low level in the tank, or against overflow, is furnished by the tell-tale sight valves in the engineer's room.

In this system, as in the drinking water system from the city mains, all water pipe is brass, including the valves, some of which have 4-inch connections. Cast iron is used for the waste pipes and galvanized iron for the vents. The 5,000-gallon supply tank is constructed of quarter-inch steel plate, electrically welded, with a large drip pan of the same construction to take care of any possible overflow. The drip pan is connected with the storm sewer piping.

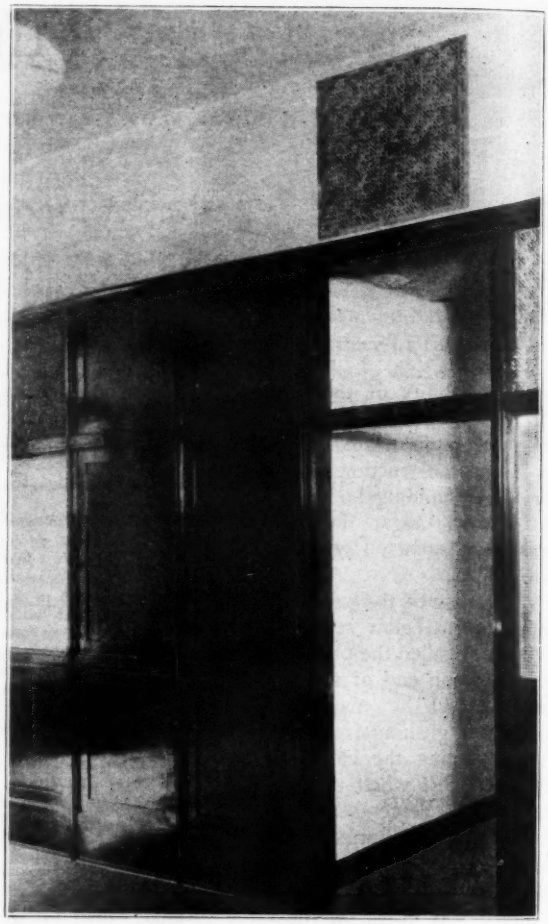
Exactly the same construction was used for the 5,000-gallon supply tank for the drinking water system. This tank, also equipped with float valves and drip pan, is in the attic alongside the other tank. The systems are practically identical except that the booster pump in the engine room for the city water system employs only a 5-hp. motor.

Sweating of Pipes Difficulty Overcome

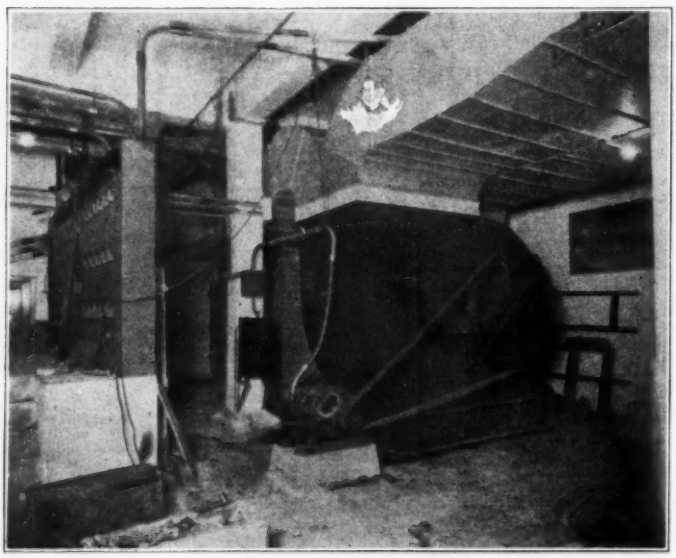
Through a centralized cooling system the city water is piped to 14 ice water fountains of brass, insulated with cork. The difference in temperature between the water and the air caused considerable sweating of the pipes when the system went into operation, so the exposed piping was wrapped in tape, surrounded by a cork filler, waterproofed and placed in copper boxes, obviating sweating and dripping.

All exposed piping and fixtures of the drinking fountains, wash basins, etc., are chromium nickel. The same metal is employed in the fire fixtures, except where brass stand-pipe connections are used. Sprinkler tops for the lawn and garden irrigation are brass surfaced.

Plumbing fixtures and connections also include two $1,000 sinks, one in each of the two kitchens maintained in the building. One kitchen is for the use of Alexander & Baldwin employes, and the other for the employes of other firms renting office space on the third and fourth floors. Nickel silver fixtures are used throughout. The sink, drainboard, etc., are also of the same metal.



Grilles in corridors (upper) admit fresh cooled air to corridors and below offices



Blower and intake vent system

The waste and storm sewer system is cast iron pipe except for exposed piping. Copper gutters and gooseneck downspouts drain into ornamental copper leader heads, thence into cast iron pipe bedded in the walls. These drain, along with the upstairs soil pipes, by gravity into the storm sewer system. All gutters, louvres and leaders are 16-ounce sheet copper.

Pumps and Sewage Ejectors Used in Sub Surface Drainage

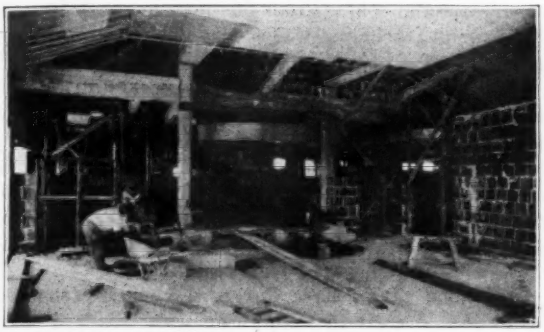
Drainage of the areaways for lighting and ventilating the basement, which is below sea level, is taken care of by a sump and bilge pump which delivers its output into the city sewer. Waste from the basement proper, the engine room and the lower level lavatories is handled by a sewage ejector. As the basement ventilating areaways are below sea level, they

are treated with a membrane waterproofing which extends to the ground level.

In addition to making use of the large fresh water spring which they turned into a complete water system for the building, the plumbing engineers capped a large salt water spring which was encountered in one corner of the excavation and fitted it with an outside fire plug at the request of the Honolulu Fire Department, providing considerable extra water in case of a fire in that district.

Ventilating Ducts Confined to Corridors

The ventilation system, one of the most thorough to be found anywhere, including the mainland, consists of



Section of vent duct basement

many hundred feet of ducts, many ornamental bronze and plastic grills, and a size 12 blower fan. In addition, practically everything is in place for the air washing and cooling system which will be made available at a later date. The blower fan and housing are mounted on a cork base, which is tied with and braced against the 20-hp. motor base. Absence of vibration and noise is so marked that it is difficult to tell whether or not the fan is operating, from a distance of five feet.

The ventilation system utilizes the corridors almost entirely—the 122-inch ducts running along the tops of the corridors with risers at the ends. This construction brings the ducts just below the ceiling of the offices off the corridors. The place of the usual transoms leading into an open corridor is taken by the ornamental bronze grills leading into the duct in the corridor ceiling. For private offices adjacent to lobbies and large offices, the ventilating ducts are carried in the ceiling of the private offices with the grills for the lobby or large office in the side of the ventilating duct, while the same type of ornamental grill takes the place of the usual transom for the private offices.

The ventilating system also includes several large ornamental plastic and bronze grills, which have been made exceedingly decorative as well as efficient. The smaller grills used in place of transoms average three feet to a section.

The ventilating system for the comfort stations and kitchens is fed by the regular ventilating ducts, but the exhaust is handled by a blower fan in the attic which pulls from the toilets and kitchen and expels the air through cast iron pipes in the roof.

Provisions for Cooling System

In the machine room, alongside the blower fan and ready to be hooked into it, is the spray chamber for the air washing and cooling system. Two 5-ton ice machines will be employed. In the spray chamber the air will be thoroughly washed and cooled to a temperature of 60 degrees. It will then be expanded and dried, the temperature being raised to 70 degrees. The dry air will cause no chills or clamminess when the cool air is turned back into the ventilating system. All ducts, conduits, and dampers for the temperature control have been installed, making the completion of this unit to the functioning point a simple job.

Throughout the entire plumbing and ventilation units, as well as throughout the entire building, the architect, contractor and artisan have kept in mind the thought of the owners—that this building was to endure for centuries if need be. The engineering and the materials used were the best available, and the resulting accomplishment speaks for itself.

Expansion

Practically all substances expand when heated and this expansion or change in volume is roughly proportioned to the difference in temperature. Accurate experimentation has established coefficient of expansion for many substances and these coefficients are listed in all mechanical handbooks either as the coefficient of linear expansion or as the coefficient of cubical expansion.

The effect of temperature changes can be calculated from the equations

$$L_2 = L_1 (1 + lt)$$

or $$V_2 = V_1 (1 + Ct)$$

where L_1 = length at initial temperature
L_2 = length at final temperature
V_1 = volume at initial temperature
V_2 = volume at final temperature
l = coefficient of linear expansion
C = coefficient of cubical expansion
t = temperature rise

The coefficient of cubical expansion is three times the coefficient of lineal expansion. They are really percentage factors, so that any units of length or volume can be used but it is necessary to know whether the coefficient is for degrees Fahrenheit or degrees Centigrade. Cooling results in a decrease in volume, in which case, for cooling t must be considered as negative.

◆

Testing for Safe Water Supplies

Bacteriological technique and methods are employed as a means of determining whether or not a water supply is safe for drinking purposes. A small amount of the water is deposited on a sterile glass plate, and to this is added a liquid substance which becomes semi-solid when cold. The germs which are in the water grow in this plate and are easily counted. Also, varying amounts of the water are placed in a tube containing sugar broth, which is fermented with the production of gas by the colon group of bacteria, which are the organisms that give evidence of sewage pollution. Inasmuch as there are several other bacteria which ferment this sugar, further tests are employed to confirm the presence of members of this group. If a positive finding results, various control measures are adopted as well as a determination of the source of the pollution.

To Find *the* Net Profit

A. J. PEEL *in another of his illuminating analyses of financial statements submitted by readers of* DOMESTIC ENGINEERING *makes some interesting comparisons on the way to* NET PROFITS

A NEW ENGLAND plumbing and heating company sends us the following letter: "We were very much interested in your article on costs in the November 16th, 1929, DOMESTIC ENGINEERING, and have worked out the past three years that we have been in business, on the basis shown in your article and have enclosed the same with statements of these years which are bed rock.

"It would appear that on a $30,000 yearly business that one owner could make a very good living as the two of us have managed to get by as you will see. . . . has been in the midst of a very bad depression but is started on the upgrade now, so that within two years we expect to double our sales, at the most conservative estimate.

"Trusting that these figures may be of some value to you and welcoming any suggestions or criticisms, we are," etc., etc.

The operating statements submitted with this letter are shown here as exhibits "A," "B," and "C." In these statements will be found the actual figures covering the various items of expense. These are substantially as given by our correspondent, the only difference being that I have shown the gross margin after deducting the cost of material sold. From this margin we deduct the total expense, including wages, and we have a net profit figure.

The value of any comparison of cost figures lies not only in comparing one year with another but in comparing with some standard costs for the industry. As explained in a previous article, these, unfortunately, are not yet available. We can, however, make a comparison with average costs worked out on the Pacific coast, and it will be seen later that these are fairly representative even when compared with eastern costs.

In Exhibit "D" I have shown in a single statement, the three-year costs in comparison with standard costs. These are shown in percentages since this is all that is necessary to check tendencies.

The Story of the Statements

Before discussing the relation between our correspondent's costs and the standard costs, let us look at the story as shown by the three years' operations. The first thing that strikes us is that with increasing sales

Exhibit "A"

Analysis February 28, 1927 to December 31, 1927

Merchandise Sales	26,814.26		
Discounts Earned	236.40	27,050.66	
Inventory 2/28/27	0.00		
Merchandise Purchases	11,973.37		
Less Inventory 12/31/27	286.23	11,687.14	
Gross margin			15,363.52
Workmen's Wages		7,195.03	
Automobile Maintenance	613.79		
Automobile Insurance	68.17		
Automobile Depreciation		681.96	
Wages—Office		440.00	
Compensation Insurance	20.00		
Public Liability Insurance	10.00		
Plate Glass Insurance	10.27		
Fire Insurance	7.05	47.32	
Partnership Insurance		369.86	
Taxes—Lowell	6.00		
Taxes—Mass Income			
Taxes—Mass License	7.00	13.00	
Interest		131.45	
Freight and Express		69.71	
Advertising		201.95	
Telephone and Tolls	84.72		
Lights	20.79		
Rent	350.00		
Office Maintenance and Shop	134.88	590.39	
Stationery		253.30	
Depreciation on Tools, etc.			
Bad Debts Charged Off			
Salaries		4,500.00	
			14,493.97
Net Profit			869.55

Exhibit "B"

Analysis December 31, 1927 to December 31, 1928

Merchandise Sales	28,976.06		
Discounts Earned	114.91	29,090.97	
Inventory 12/31/27	286.23		
Merchandise Purchases	11,915.46		
	12,201.69		
Less Inventory 12/31/28	390.69	11,811.00	
Gross Margin			17,279.97
Workmens Wages		8,437.95	
Automobile Maintenance	625.06		
Automobile Insurance	93.79		
Automobile Depreciation	145.00	863.85	
Wages—Office		520.00	
Compensation Insurance	104.35		
Public Liability Insurance	65.75		
Plate Glass Insurance	10.27		
Fire Insurance	7.25	187.62	
Partnership Insurance		369.40	
Taxes—Lowell	22.72		
Taxes—Mass Income	10.22		
Taxes—Mass License	7.00	39.94	
Interest		265.58	
Freight and Express		46.55	
Advertising		234.23	
Telephone and Tolls	108.35		
Lights	46.08		
Rent	420.00		
Office and Shop Maintenance	193.31	767.74	
Stationery		94.25	
Depreciation on Tools, etc.		85.25	
Bad Debts Charged Off		11.23	
Salaries		5,200.00	
			17,123.59
Net Profit			156.38

Exhibit "C"

Analysis December 31, 1928 to December 31, 1929

Merchandise Sales		30,558.46	
Discounts Earned	78.00	30,636.46	
Inventory 12/31/28	390.69		
Merchandise Purchases	13,722.38		
	14,113.07		
Inventory 12/31/29	985.55	13,127.52	
Gross margin			17,508.94
Workmen's Wages		7,731.04	
Automobile Maintenance	770.08		
Automobile Insurance	108.80		
Automobile Depreciation	100.00	978.88	
Wages—Office		520.00	
Compensation Insurance	131.50		
Public Liability Insurance	19.06		
Plate Glass Insurance	10.27		
Fire Insurance	7.45	168.28	
Partnership Insurance		369.40	
Taxes—Lowell	25.46		
Taxes—Mass Income	4.53		
Taxes—Mass License	7.00	36.99	
Interest		226.36	
Freight and Express		57.26	
Advertising		640.98	
Telephone and Tolls	102.55		
Lights	55.08		
Rent	420.00		
Office and Shop Maintenance	230.58	808.21	
Stationery		143.39	
Depreciation on Tools, etc		23.67	
Bad Debts Charged Off		389.61	
Salaries		5,200.00	
			17,294.07
Net Profit			214.87

Exhibit "D"

	Standard Percentages	1927	1928	1929
Sales (100%) ($15,000 to $30,000)	100%	$27,050	$29,090	$30,636
Labor	31.9	26.4	24.00	25.00
Cost of materials	50.3	43.3	40.5	43.00
TOTAL	82.2	69.7	69.5	68.00
Margin	17.8	30.3	30.5	62.00
Overhead Expense:				
Tools expense	0.5	.....	0.3	.06
Auto expense	2.4	2.5	3.1	3.2
Advertising	0.7	0.75	0.87	2.8
Bad accounts	1.3	.....	0.03	1.26
Misc. shop	0.4			
Misc. store	0.4	2.56	1.95	2.15
Misc. office	0.7			
Office salaries	5.4	1.6	1.8	1.7
Dues	0.1	.....	.....	.....
License	0.1	.....	.....	.....
Taxes	0.4	0.003	0.01	0.01
Interest paid	0.8	0.48	0.91	0.7
Interest on investment	2.6	.....	.....	.....
Insurance	0.4	1.5	2.00	1.7
Rent	2.6	1.3	1.45	1.37
Salaries (owners)	.....	16.5	17.5	17.00
TOTALS	18.8	27.193	29.92	31.93
	Loss	1.0% Gain	3.107% Gain	.58% Gain .07%
Owners' salaries deducted from Expense and added to profits	16.4	16.5	17.5	17.00
Profits including owners' drawings	15.4% of sales	19.607%	18.08%	17.07%

NOTE: In the standard costs shown above, the owners' salaries or drawings are included in Labor, Office salaries, and Interest on Investment.

and increased margins, the net profit has decreased. The reason for this must be looked for in the operating costs exclusive of labor and material. Labor and material have been fairly stable during the three years, 1927, 1928, and 1929.

The one item that stands out as soon as we begin to examine the units of expense, is advertising, which increased from .87% in 1928 to 2.8% in 1929. Represented in actual amounts, the figures are from $234 to $640. But no single item need give us less concern than this added expenditure on advertising. I often feel that all expenditure on advertising—if it is well-planned and scientific—should be treated as prepaid expense, an *asset,* and written off month by month as the results of advertising appear on the books in increased sales. As we don't know when this advertising expense was contracted, we may well assume, I think, that the results were not fully realized during the year 1929, and that our friends will cash-in on some of this during the current year.

Another item of expense which warrants examination, is the cost of operating the automobile. This has increased each year. Naturally with the increased depreciation it becomes more expensive each year, but it is often wiser to invest in a new truck rather than run on with an old truck that is eating up profits. I think we can say without fear of contradiction that this firm is spending too much on automobile operation.

The cost of operating the office, store, and shop, exclusive of salaries, is another item which we might well look into. While this is not increasing it may be too high. The item for stationery (see Exhibits "A," "B," and "C") seems somewhat out of the way, unless this includes *advertising* stationery, in which case it should be included with advertising.

Partnership insurance is a substantial cost in these statements, but here again, I would be inclined to consider this in the nature of an investment rather than expense.

Net Profits

I would point out that though the net profits are small, it must be borne in mind that the partners have been taking more out of the business in the form of salary than they did in 1927. I have shown on Exhibit "D" the condition of the business as it would appear if we throw back the earnings of the partners into earned profits. The result is the same, of course; from 19.60% gross profit in 1927 the percentage has dropped to 17.07% in 1929, notwithstanding the fact that sales increased by $3,600.

Now let us review these figures in the light of the standard figures shown in the first percentage column in Exhibit "D." The interesting thing is that our friends on the Pacific coast are up against it insofar as labor and material costs are concerned. Businesses doing a sales turnover of from $15,000 to $30,000 a year, are not making a profit in the majority of cases, though their overhead is lower than that of our correspondents.

In studying the standard figures it should be borne in mind that the drawings of the owners are included in the items "Labor" and "Office salaries" and "Interest on investment." If we deduct these and throw them into profits we get a gross profit of 15.4% instead of a loss of nine-tenths of a cent for every dollar of sales.

Referring again to the cost of operating motor trucks or autos, it will be noted that the standard figures are lower than those of our New England correspondents. So also is the cost of running the office, store, and shop

(Continued on Page 175)

Conversion *of a* Vapor System *into a* Vacuum-Vapor Job

By HUGH BERSIE

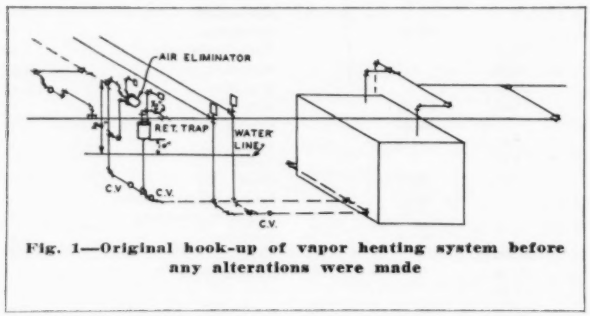


Fig. 1—Original hook-up of vapor heating system before any alterations were made

THE writer was given a vapor system shown in Fig. 1 and 2. The system did not operate satisfactorily in the respect that the radiators, distant from the boiler, received but little steam, except with a strong fire. The 38½ ft. radiator in the small bedroom and the 45½ ft. radiator in the larger bedroom were the worst offenders. The smaller bedroom particularly was cold most of the time. The piping was well sloped and of ample size, as shown in the diagrams.

In searching for the trouble, it was noted that there was rarely any vacuum exceeding 2 or 3 inches. It was concluded that this lack of distribution was due to air in the system. A thorough search was then made for air-leaks. First of all, it was necessary to hit upon some method of testing for air-leaks. There was no visible evidence of any, but minor leaks, which were shown by water drips from the steam lines. The important leaks seemed to be in the return line. Oils of wintergreen and peppermint were put in the boiler, but in this case the test was not satisfactory. As a second method, city water pressure was applied to the system and the leaks showed up rapidly. Approximately 15 lb. pressure was found sufficient. The only difficulty was getting the air out of the system so that the water would come through and show the location of the leaks. It was found necessary to remove the safety valve and the air check valves and plug the openings. If the water was left in the system several days, the leaks showed

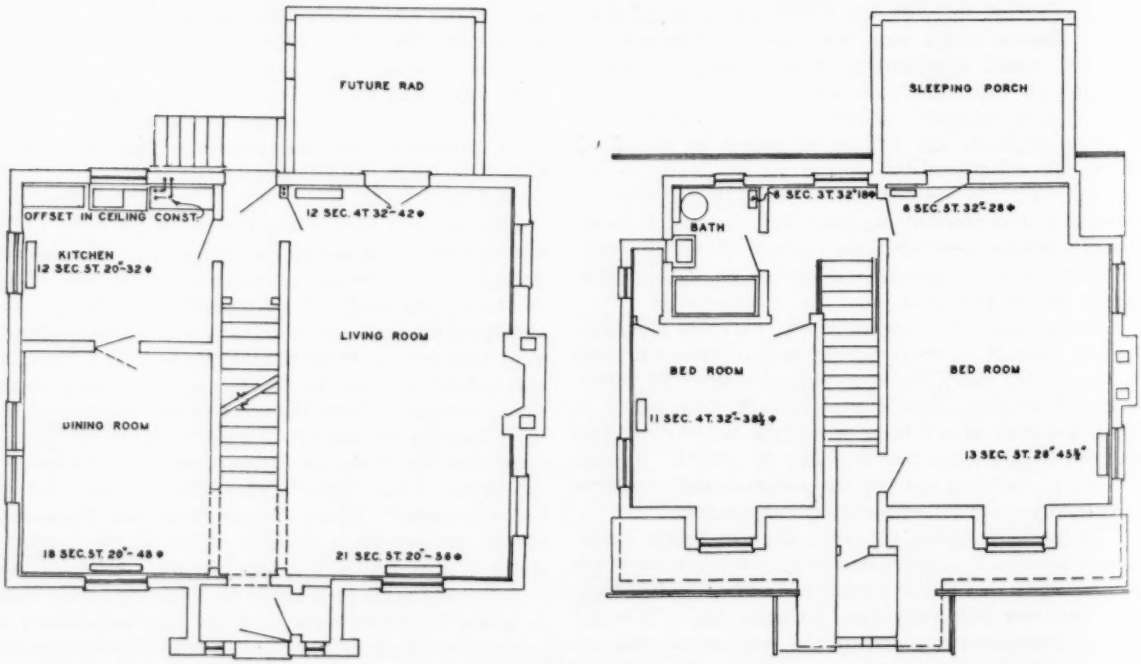


Fig. 2—First and second floor plans of building indicating placing of the radiation and, to a certain extent, the heat requirements

up more certainly, especially at the high points of the system where air evidently was trapped. Leaks were found at the following points: Pipe joints, radiator valves, water gauge, trap connections to radiators, and at blow holes in pipe fittings.

These leaks were fixed as follows: Almost all the leaking pipe joints were repaired by applying compounds made for this purpose. The bad joints were taken apart and screwed up tighter, using thread dope. The radiator valves that leaked were replaced by new ones designed especially for vapor systems. The water gauge fittings were placed in careful alignment, the drain pet cock reground and the valves and the glass repacked. The radiator traps were disconnected and the tail pieces screwed up tighter. Pipe fittings that had holes in them were replaced. The system was then put into operation again and still practically no vacuum was obtained. The safety valve was tested separately by placing it under water and putting air pressure on it; it leaked and was replaced by a new tight one. The air check valves were easily tested by immersing them in water and blowing through them, and were found to leak badly. There were two air checks installed—one on the air eliminator, the other on the return trap. It was then decided to connect the two together with a pipe and thus eliminate one of the air checks. In this case, as in the case of the radiator valves, new air checks of the type of generally accepted quality and design were installed.

Why is it that the factory cut threads mentioned in this article remained vacuum tight and many of the threads cut on the job leaked. Certainly it was not because of the tools because there is nothing made which cannot be abused and a tool which will cut a perfect thread once will cut a perfect thread again and all times thereafter,—providing it is handled properly. Providing it is handled properly, there is the answer. It takes a certain amount of skill and time to handle tools properly, to know when a joint has been screwed together tight enough to be leakproof, and skill and time cost money and some jobs are figured so close that money is not supposed to be spent in making installations.

In this type of set-up, very often the contractor who makes an installation of this kind is not called back on the job to make corrections. The owner has learned his lesson and appeals to the responsible contractor who must bring up to normal the system of low quality materials and careless workmanship, a result of estimations made on the basis of time and materials—minus.

Even under these more favorable conditions of owner attitude, the remodeling must be done for a price. This article describes what was recently done in overcoming the handicap of inferior materials and workmanship in an actual installation.

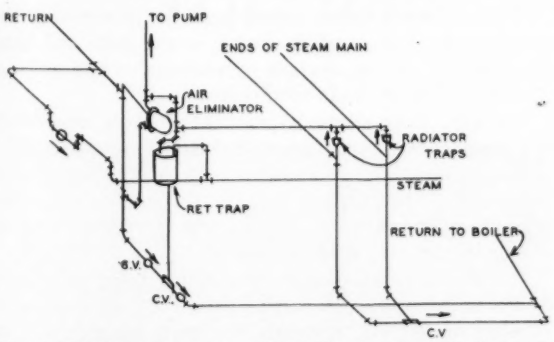


Fig. 3—Hook-up of vapor system after it was revised to overcome original poor workmanship and inferior grade of materials and equipment

For the first time the system began to show some vacuum—6 to 8 in. Then the two air vents on the ends of the steam mains were tested and found to leak air. They, also, were tested by blowing through them while they were immersed under water. They were removed permanently and in their places were installed radiator traps. These radiator traps were vented into the air eliminator. Thus, we had reduced the air vents from three to only one. The connections were then as shown in Fig. 3.

The distribution was considerably improved and the system was operated six months with fair results.

With the system cold, the following readings were taken:

Vacuum, inches	Time, hours
13.0	0
9.4	144
9.1	216

This averaged a drop of only ½ inch a day—a very satisfactory condition. However, more leaks developed and the vacuum of 8 to 10 inches dropped to 2 to 4 inches. The distribution was good except when the vacuum dropped.

Vacuum Pump Installed

It was then decided to install a vacuum pump. The pump was connected to the air eliminator and the pump controlled by hand. Good distribution was obtained because the vacuum was usually kept up to 10 to 15 in. A pressurestat switch was connected to the return line and adjusted so that the pump would start at 6 inches and stop at 9 inches. The operation was very satisfactory. When the room thermostat accelerated the fire, the vacuum would drop because the amount of steam generated exceeded that which was condensed. The vacuum would, accordingly, drop to 6 inches. The pump would then start and keep the vacuum in the return line between 6 and 9 inches. When the water level in the return trap rose to 16 inches above the boiler level, the trap would operate and force

(Continued on Page 174)

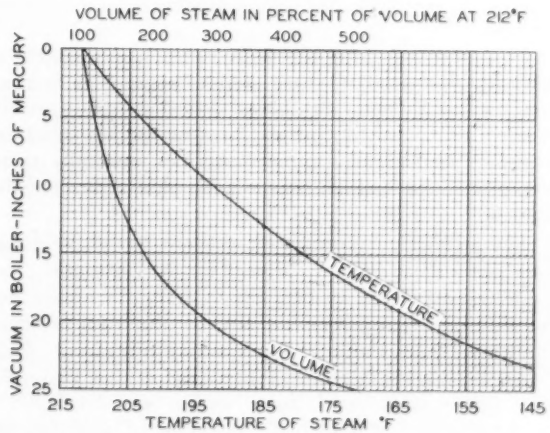


Fig. 4—Curves showing how steam temperature is reduced and steam volume is increased under vacuum

Trade School Teachers

The qualifications which go to make a good teacher of the plumbing craft

By R. M. STARBUCK, JR.

IT DOESN'T matter whether it is teaching a grade-school class or the most advanced class in a great university, what the student gets out of the instruction given him depends much more upon the qualifications of the teacher than upon any other factor that enters into the proposition.

And it is just so with a class in plumbing.

A teacher's knowledge of the subject is not the whole story either. He may know his subject thoroughly and yet be almost a total failure as a teacher. Many things enter into the proposition. He must have the confidence and respect of his class; he must have the ability to impart the knowledge he possesses, and perhaps above all, he must have the sincere desire to help his students.

We recall the case of a brilliant student at one of our leading engineering colleges, who thought to pay part of his expenses by teaching in an evening school. He was one of the high-stand men in his class, and yet he did not make good. He lacked in more than one respect. He talked way above his students' heads; he couldn't get down to their intellectual level, but expected them to get up to his. For some reason too, he could not hold his class, they got out of bounds. A third reason for his failure was said to be that he couldn't handle each boy just where he found him, but expected to teach the evening school class in the same manner as a day-school class, and that was impossible.

Teacher Training Has Been Unorganized

And so we see that not every man is born to be a teacher. As a matter of fact, real teachers are a scarce article. The teaching of classes in plumbing presents certain peculiar difficulties.

In the first place, the training of teachers in subjects relating to plumbing has been unorganized and unstandardized.

In the second place, the work is too new probably to have reached a point where definite courses of instruction are available. This latter difficulty forces an untrained teacher to lay out and present courses which he himself has had to originate, and this generally is an impossible combination, discouraging alike to teacher and student.

The procuring of competent teachers for trade classes has been a most difficult problem for local educators, and for state educators. In 1917 the federal government took hold of the proposition as one of the two principal branches of the work of the Federal Board for Vocational Education, which was organized in that year. As may well be understood, this work has been developed in a remarkable way under the direction of some of the best qualified experts our country has produced.

In this article we are going to quote at some length from a publication, issued by the Federal Board, entitled "Trade and Industrial Education."

The Federal Board for Vocational Education has the responsibility of disbursing annually several millions of dollars of funds appropriated by the Federal Government for trade and industrial education. This distribution is made to each of the 48 states through the state boards of education. While the federal authorities have nothing to do with state educational administration, they do reserve the right to approve or reject state plans for carrying on trade and industrial education. The result of this is that in each state there has been set up a scheme for the supervision of teacher training in trade and industrial schools and classes.

The Securing of Federal Aid

In order to secure federal aid, the state must provide state supervisors and local supervisors of vocational teacher training. It should be stated that in giving this aid, the state is required by the federal board to expend at least an equal amount for the maintenance and development of teacher training.

In the bulletin issued by the federal board, to which we have alluded, is found the following statement:

"Trained teachers and trained supervisors are absolutely indispensable in promoting effective vocational education. The board therefore urges state boards to provide for supervision and inspection, and to make such supervision as extensive as possible. Only in this way can schools get the help they should have."

Then follows much interesting matter concerning the qualifications that must be found in the state and local supervisors. These include educational requirements, also the following trade requirements:

"At least three years of practical working experience as a wage earner in a trade or industrial occupation."

The training of vocational teachers by qualified teacher trainers may be carried on in a variety of ways, depending on the methods followed by the state board, as shown in the following statement:

"While the detailed work of training teachers may be delegated to approved institutions, such as state universities or colleges, it should be clearly understood that the state board is the agency which is finally responsible for the efficiency of the teacher-training program."

In this particular article, we are especially interested in the teacher, and with the foregoing brief survey, we will confine our attention to what the government publication has to say concerning the vocational teacher.

Selection of Teachers

Dealing first with the problem of selection of men qualified to become teachers of plumbing trade classes, the government bulletin has the following:

"During the past 10 years a great deal of profitable experimentation by certain states has been carried on with respect to the selection of instructors of trade and industrial schools of the vocational type. The matter of selection of students is of the greatest importance, in connection with any program of vocational training, and in view of the fact that teaching in a trade or industrial school is a recognized vocation, the matter of selection of candidates to be trained is of first importance.

"The problem of selecting suitable candidates is made especially difficult because of the fact that a trade instructor must be not only a competent teacher, but a high-grade tradesman who will command the respect of his fellow craftsmen and of employers as well. Added to this is the fact that such a tradesman, in taking a position in a public school system, is usually confronted with certain prerequisites and requirements in the way of professional training far in excess of those possessed by any one who has not received an academic collegiate training. Such requirements have been formulated from a consideration of the assets and training brought into the school system by prospective teachers trained in colleges and universities. While the tradesman has not had the advantage of certain professional training, he does possess certain assets which are indispensable for the proper teaching of trade and industrial subjects, and it is being increasingly recognized that equivalent credit should be given in such cases, in lieu of certain formal requirements."

After long experience and consideration of the subject of qualifications that a vocational teacher should possess, the following list is considered to show the principal ones:

1. Trade mastery or occupational competency.
2. Occupational prestige and standing in trade.
3. Pride in his trade.
4. Self-confidence.
5. Ability to get along with associates.
6. Ability to work harmoniously with official superiors.
7. Ability to get a job done under difficulties.
8. The habit of regarding himself as a success in his field.
9. Habit of meeting responsibilities.
10. Ability to express himself clearly and briefly, both orally and in writing.
11. Good character.
12. Suitable age.

Plumbing Trade to Profit

This list impresses one with the idea that the modern teachers of plumbing classes are being selected scientifically. In years to come the plumbing trade is bound to profit from this selective process.

There is no substitute for qualification No. 1—"No amount of general education or technical training will enable a man to teach a trade, if he lacks the all-important qualification of being a master workman in that trade."

The following are a few of the comments on the remaining qualifications:

"In some states a total of eight years' experience in the trade, including the period of apprenticeship, is regarded as satisfactory evidence of the possession of the trade qualification. Other states accept men with less experience.

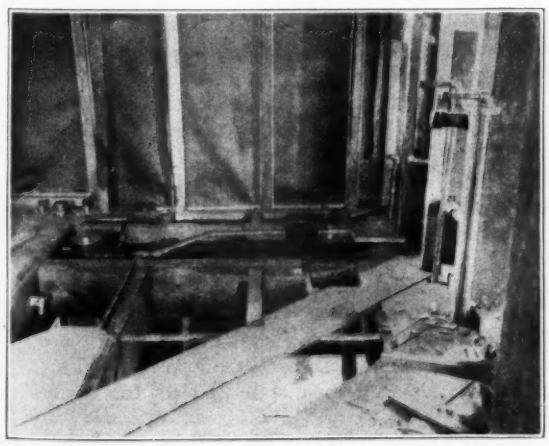
"Other things being equal, a journeyman worker in a trade is likely to stand high with his associates and with employers, in proportion as he is an expert workman. Occupational prestige is also evidence that the individual possesses desirable personal characteristics.

"It would appear to be highly desirable for an in-

Job *and* Shop Practice

SETTING SOIL FITTINGS IN A JOIST FLOOR

As Used by Our Readers



Soil fittings in a joist floor

TOO many master plumbers and journeymen are neglectful of the carpenter in the pursuit of their work. The writer has seen instances where the plumber has gone through a building and cut joists and studs in any manner simply in order to make it easier for him to lay pipe, notwithstanding the fact that the structural strength of the building was weakened considerably.

Here is a case of co-operation between the plumber and the carpenter. In this case it was necessary to set soil pipe in a bathroom floor, but instead of cutting the joists and weakening the floor the plumber had the carpenter arrange the joists so that no cutting was necessary. The carpenter fixed a header joist as shown in the picture, and the soil pipe was set in the space provided for it by the header. This was a good and workmanlike way to do the job. Get together with the carpenter on your job and let him help you. Better results are obtained through co-operation.

structor in a trade school to feel a real pride in his occupation. It is hardly to be expected that one who is seriously lacking in trade pride will be able to exert the right sort of influence upon a group of apprentices or preapprentices in a trade school.

"While too little self-confidence on the part of a teacher is a handicap, too much self-assurance is almost as great a handicap.

"Ability to get along with associates means that the candidate should have a certain amount of social intelligence quite independent and distinct from his general intelligence, his education, or his knowledge and skill in his trade. Absence of this characteristic does not necessarily impair a person's usefulness on a job where he works as an individual on technical problems or experimental work. It will, however, be a serious handicap to a trade teacher if he has firmly established the habit of working and thinking as a star performer and is unable to get along with others without picking a fight or quarreling over inconsequential matters. In brief, this characteristic indicates that the candidate has the ability to cooperate with a minimum of friction.

"Ability to work in harmony with official superiors is closely associated with the preceding. It is, however, not uncommon for a person to possess the ability to get along with his associates and at the same time run into difficulties at frequent intervals with his official superiors. The reverse situation is also true.

"Ability to get a job done under difficulties means that resourcefulness in meeting all sorts of unusual difficulties and unexpected situations is an asset to an instructor in a trade school. Some men work well on a job so long as everything works smoothly and all of the tools and equipment necessary to the prosecution of the work have been provided and are in good working order. Where work has to be done under unusual or special conditions, however, some men are inclined to quit and wait for the supervisor or foreman to decide what should be done next. The type of man who is most desirable as a trade school instructor is the type who will use his head on the job up to full capacity, and carry the job through to completion without setting up a series of alibis coupled with the conspicuous fact that the job is not finished. A trade school instructor who is always complaining because of some shortage of special tools or equipment and explaining why he can not carry on an efficient training program in his shop is a never-ending source of annoyance to the principal and those higher in authority in the organization. Other things being equal, the man who has to some degree developed the habit of getting a good job done under adverse conditions, and in the absence of all of the facilities that might be desired, will be a more acceptable instructor than one who is lacking in resourcefulness.

"The habit of regarding himself as a success has to do largely with an attitude of mind on the part of the candidate. The attitude of mind to be desired would be associated with the fact that the expert tradesman regards himself as a success in his chosen field of work, and does not feel called upon to take second place to any other craftsman in his particular line.

"The presence or absence of the habit of assuming responsibilities is probably due to the habits of thought which a man has acquired in connection with his work, although some people naturally accept responsibilities associated with their jobs, while other people attempt to shirk such responsibilities. Other things being equal, the man who has developed the habit of assuming all the responsibilities associated with his work, and of meeting these responsibilities satisfactorily, rather than evading them, will be most satisfactory as a trade school instructor.

"The ability to speak and write correctly, clearly and briefly, appears to be of great importance, and constitutes one of the major qualifications, second of course to trade competency and perhaps to one or two of the other characteristics previously discussed, but at the same time almost indispensable.

"Ability as an instructor and actual skill in the art of teaching can only be acquired by experience. Practice teaching during the preemployment training is of value, but the most effective results can only be secured after the prospective teacher has entered upon a regular teaching position, and then receives supervision, suggestions, and counsel from an experienced local supervisor who feels a definite responsibility for guiding the new teacher through the apprentice stage of teaching.

"Too much standardization of courses of study with no opportunity to do any individual planning or exercise any initiative whatever has a deadening effect on a teacher, and tends to reduce the all-round efficiency of his work. General planning ability relative to the entire training course, and ability to plan for each day's work and each individual lesson are of prime importance.

"Ability to appreciate the difficulties of a learner is important with all teachers, and especially so with persons who have had many years of experience in the practice of their trades subsequent to their own period of learning. Long years of successful experience in a trade tend to make a person impatient with the awkward attempts of a beginner, and also to underestimate the difficulties which a learner experiences in acquiring new skills or additional technical information."

Additional Training for Teachers

The bulletin from which we have quoted, points out seven methods whereby those who are already teaching plumbing subjects may gain additional training. These are as follows: 1.—The extension course. 2.—The intensive summer course. 3.—The regular summer course. 4.—Special conferences. 5.—Correspondence service. 6.—Individual help on the job. 7.—Individual professional improvement.

To prospective teachers, three methods of training are pointed out: 1.—Residence course. 2.—Extension course. 3.—Summer course.

To those who may be interested in this subject, we would state that the methods named above are fully elaborated in the bulletin, which is known as Bulletin No. 17 and may be obtained from the Federal Board for Vocational Education, Washington, D. C.

Each of the 48 states now has a state supervisor of vocational education, also a state director and those who are interested in the subject we have been discussing should consult with their state officials for further information.

We are able to furnish a list of these supervisors and directors upon request.

Pipe and Orifice Sizes for Small Gravity Circulation Hot Water Heating Systems

By ELMER G. SMITH

Article II

THIS is the second of three articles which constitute the report of Mr. Smith which was presented at the recent Philadelphia meeting of the American Society of Heating and Ventilating Engineers. The first part of the report appeared in the February 8 issue.

How to Select Orifice Sizes When the Orifices Are Rated in Square Feet of Vapor Radiation

If, instead of making the orifices on the job, it is preferable that valves be purchased already equipped with orifices having their capacity in square feet of vapor radiation marked on them, the procedure is exactly the same except that Table 6 is used instead of Table 5. When this is done, the following sizes are obtained:

Radiator 1 (Section 1, 35 sq. ft.) takes a 21-30 orifice.
Radiator 2 (Section 2, 63 sq. ft.) takes a 71-80 orifice.
Radiator 3 (Section 2, 22½ sq. ft.) takes a 21-30 orifice.
Radiator 4 (Section 3, 31½ sq. ft.) takes a 41-50 orifice.
Radiator 5 (Section 3, 33¾ sq. ft.) takes a 51-60 orifice.
Radiator 6 (Section 4, 57 sq. ft) takes a 141-150 orifice.
Radiator 7 (Section 4, 57 sq. ft.) takes a 141-150 orifice.
Radiator 8 (Section 1, 60 sq. ft.) takes a 41-50 orifice.
Radiator 9 (Section 2, 86¼ sq. ft.) takes a 101-110 orifice.
Radiator 10 (Section 4, 75 sq. ft.) takes a ½ in. orifice.

It will be noticed that a few inch sizes are included with the vapor sizes. This is because a large first-floor radiator may, in some cases, require a larger orifice than is made for vapor systems. These extra large sizes will, of course, have to be made on the job.

How to Determine the Proper Settings for Valves Having an Adjustable Orifice Calibrated in Square Feet of Vapor Radiation

So far as the writer knows, these valves are made only in the ¾ in. size. This means that it will often be necessary to reduce the size of the flow risers in order to connect the valve. This will probably not cause any serious trouble, if the reduction is made fairly close to the valve. It is, of course, especially important to use a full-sized return union elbow. The number of radiator sizes available is also somewhat more limited than in the two previous cases, but the range is large enough so that these valves work all right on some systems. In determining the valve setting, use Table 7, which differs from Tables 5 and 6 in that the number of square feet of radiation is given in the margin and the settings comprise the body of the table.

To determine the setting for radiator 1, locate in

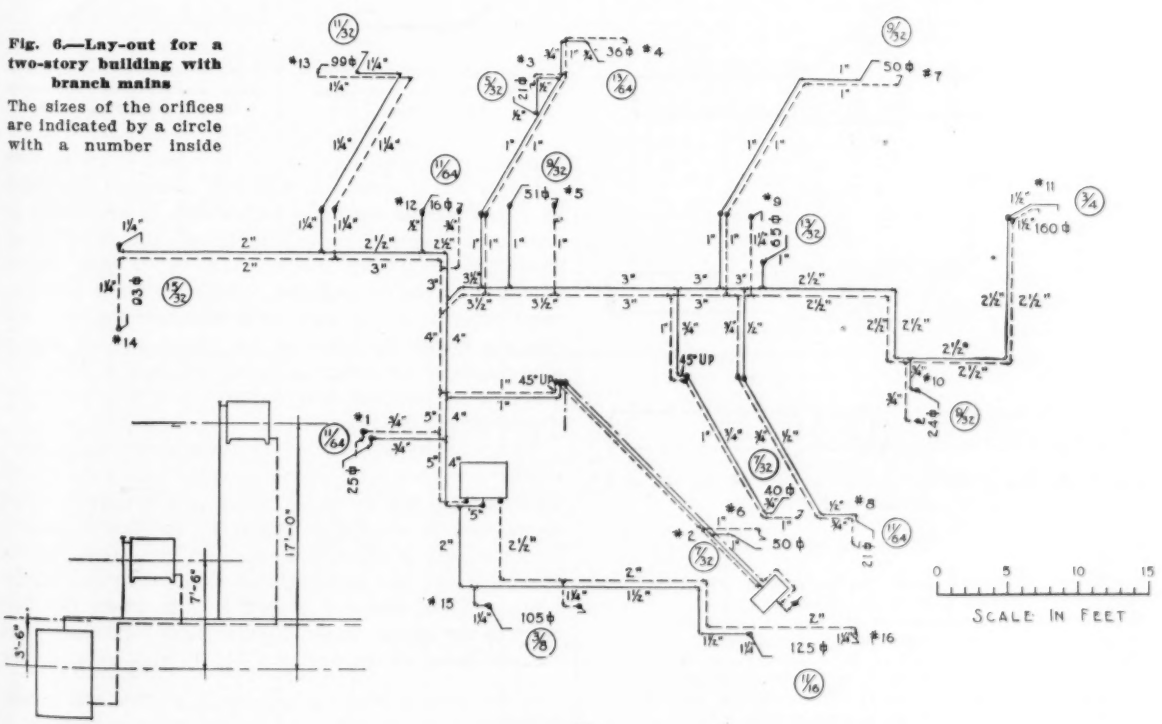


Fig. 6.—Lay-out for a two-story building with branch mains
The sizes of the orifices are indicated by a circle with a number inside

Table 7, Section 1, the column headed "7-8" and find on the line with 35 the number "36," which is the required setting. The setting for radiator 2 may be selected from the column headed "7-8" in Table 7, Section 2. The number 63, however, is not located in the margin of the

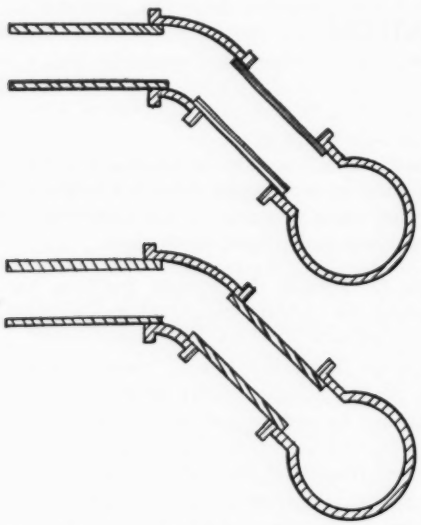


Fig. 7—Suggested vertical section of mains and riser laterals for lines having branch mains

table, so by interpolation find that the required setting is about 79.

Proceeding in a similar manner, the valve settings may all be determined as follows:

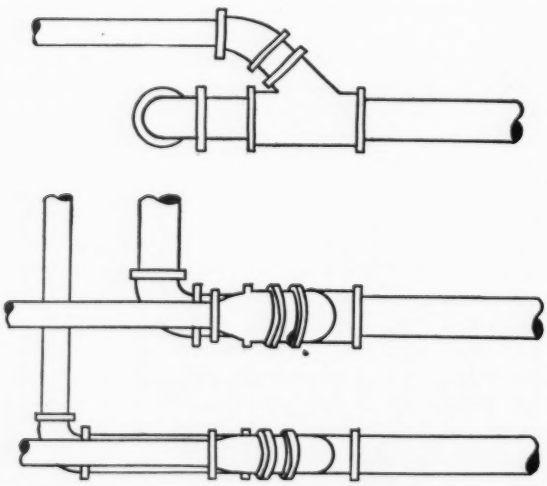


Fig. 8—Method of taking a short branch off the top of a long branch

For

Radiator 1 (Section 1, 35 sq. ft.) the setting is 36.
Radiator 2 (Section 2, 63 sq. ft.) the setting is 80.
Radiator 3 (Section 2, 22½ sq. ft.) the setting is 30.
Radiator 4 (Section 3, 31½ sq. ft) the setting is 55.
Radiator 5 (Section 3, 33¾ sq. ft.) the setting is 62.
Radiator 6 (Section 4, 57 sq. ft.) the setting is 155.
Radiator 7 (Section 4, 57 sq. ft.) the setting is 155.
Radiator 8 (Section 1, 60 sq. ft.) the setting is 58.
Radiator 9 (Section 2, 86¼ sq. ft.) the setting is 114.
Radiator 10 (Section 4, 75 sq. ft.) the setting is 220.[3]

How to Deal with Branched Circuits

In Fig. 6 is illustrated a larger system than the one just considered. It differs from it in that it has second-floor radiators and a branched circuit. In the case of a branched circuit of this sort it is probably best to arrange the mains one above the other with the flow mains on top, as illustrated in Fig. 7, instead of side by side as is the usual practice. If this is not practical, the shorter branch may be carried over the longer one by means of two 45 deg. bends as illustrated in Fig. 8. If head room is important, as it usually is, the *Y* connections may be rotated downward until the upper pipes lie flat upon the lower pipes.

It will also be noticed that in some cases the construction of the building is such that the lateral portions of the risers require an extra turn. In cases like this,

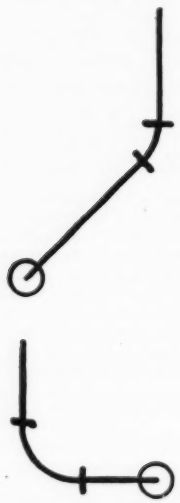


Fig. 9—Low friction connections for riser lateral requiring a bend

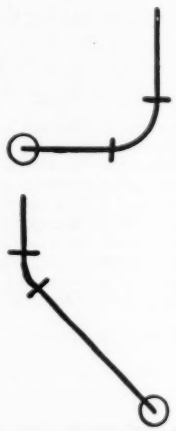


Fig. 10—Alternative low friction connections for riser lateral requiring a bend

illustrated by radiators 2 and 6, it is best to go up with a 45 deg. elbow instead of a 90 deg. elbow, as illustrated by Fig. 9, or else make the turn with a 45 deg. elbow as illustrated in Fig. 10. In either case, use one 90 deg. elbow and one 45 deg. elbow, where two 90 deg. elbows would otherwise be required. An even better arrangement, when it can be used, is to eliminate the bend and run the lateral portions of the risers so that one is directly above the other as illustrated in Fig. 4B. For a system of this size it is probably best to arrange the data as shown in Table 8.

The numbers in column 1 of Table 8 give the radiator numbers consecutively beginning at the end of the branch farthest from the heater. The numbers in column 2 give the section of the line in which the radiator is located. The numbers in column 3 represent the height of the mid-point of each radiator above the mid-point of the heater. Thus, Radiator 11 is 8 ft. 0 in. above the mid-point of the heater, while Radiator 10 is 7 ft. 4 in. above the mid-point of the heater. The heights vary a trifle

[3]If the valve is calibrated only up to 200 this will be near enough.

Table 6—Capacities in Square Feet of Direct Radiation of Orifices Designed for Vapor Systems

Vapor Rating of Orifice	Section 1 — Height Above Midpoint of Heater in Feet																										Section 1	Vapor Rating of Orifice
	4½	5			6	7	8	9	10		11		12		13		14		15		16		17		18			
Two 0-10									7.6	10.9	7.0	11.5	8.4	12.	8.7	12.4	9.0	12.8	9.3	13.3	9.7	13.8	10	14.2	10.4	14.6	Two 0-10
0 10	7.6	15.2	8.4	16.7	9.0	18.0	9.7	19.4	10.9	21.6	11.5	22.6	12.	23.9	12.4	24.6	12.8	25.6	13.3	26.6	13.8	27.6	14.2	28.4	14.6	29.2	0	10
11 20	15.2	22.2	16.7	24.8	18.0	27.0	19.4	28.9	20.6	32.5	22.6	33.9	23.9	35.4	24.6	37.	25.6	38.4	26.6	39.8	27.6	41.3	28.4	42.5	29.2	43.7	11	20
21 30	22.2	30.1	24.8	33.2	27.0	35.6	28.9	38.3	30.8	40.7	32.5	43.0	33.9	45.0	35.4	47.5	37.	49.3	38.4	51.2	39.8	53.1	41.3	55.	42.5	56.6	43.7	58.3	21	30
31 40	30.1	37.2	33.2	41.0	35.6	44.2	38.3	48.0	40.7	51.1	43.0	54.0	45.0	56.6	47.5	59.3	49.3	61.5	51.2	64.0	53.1	66.3	55.	68.7	56.6	70.5	58.3	72.8	31	40
41 50	37.2	44.1	41.0	49.4	44.2	53.8	48.0	57.6	51.1	61.4	54.	64.5	56.6	67.9	59.3	71.	61.5	74.0	64.0	76.9	66.3	79.6	68.7	82.5	70.5	85.	72.8	87.6	41	50
51 60	44.1	52.2	49.4	57.5	53.8	62.5	57.6	66.9	61.4	71.0	64.5	75.1	67.9	78.0	71.	82.	74.0	86.1	76.9	89.5	79.6	92.8	82.5	96.	85.	99.	87.6	102.	51	60
61 70	52.2	59.2	57.5	66.5	62.5	71.1	66.9	76.5	71.0	81.0	75.1	85.0	78.0	90.5	82.	94.8	86.1	98.5	89.5	102.5	92.8	106.1	96.	110.	99.	113.	102.	117.	61	70
71 80	59.2	66.6	66.5	73.7	71.1	80.2	76.5	85.0	81.0	92.0	85.	97.2	90.5	102.	94.8	107.	98.5	111.	102.5	115.0	106.1	120.	110.	124.	113.	128.	117.	131.	71	80
81 90	66.6	74.2	73.7	81.0	80.2	87.6	85.0	96.1	92.0	103.	97.2	108.	102.	114.	107.	119.	111.	123.	115.0	128.	120.	133.	124.	138.	128.	142.	131.	146.	81	90
91 100	74.2	81.0	81.0	90.5	87.6	98.3	96.1	105.	103.	112.	108.	119.	114.	125.	119.	130.	123.	136.	128.	141.	133.	146.	138.	151.	142.	156.	146.	160.	91	100
101 110	81.0	89.3	90.5	98.6	98.3	107.	105.	115.	112.	123.	119.	129.	125.	134.	130.	141.	136.	146.	141.	154.	146.	159.	151.	165.	156.	169.	160.	175.	101	110
111 120	89.3	97.0	98.6	107.	107.	116.	115.	125.	123.	131.	129.	139.	134.	146.	141.	153.	146.	160.	154.	167.	159.	173.	165.	179.	169.	184.	175.	190.	111	120
121 130	97.0	104.	107.	115.	116.	125.	125.	132.	131.	141.	139.	149.	146.	157.	153.	164.	160.	172.	167.	179.	173.	186.	179.	192.	184.	198.	190.	204.	121	130
131 140	104.	112.	115.	124.	125.	132.	132.	142.	141.	151.	149.	160.	157.	169.	164.	176.	172.	185.	179.	192.	186.	199.	192.	206.	198.	212.			131	140
141 150	112.	120.	124.	130.	132.	141.	142.	151.	151.	162.	160.	171.	169.	182.	176.	189.	185.	197.	192.	205.	199.	212.							141	150
151 160	120.	127.	130.	137.	141.	150.	151.	161.	162.	172.	171.	182.	182.	192.	189.	200.	197.	210.											151	160
161 170	127.	131.	137.	146.	150.	159.	161.	171.	172.	182.	182.	193.	192.	202.															161	170
½	131.	161.	146.	184.	159.	201.	171.	216.	182.	230.	193.	244.																		
⅞	161.	205.	184.	228.																										

	18	20	20	22	22	24	24	26	26	28	28	30	30	33	33	36	36	40	40	43	43	46	46	50	50	55	55	60		
Two 0-10	10.9	15.4	11.5	16.2	12.0	16.9	12.4	17.8	12.8	18.1	13.3	18.8	14.	19.7	14.6	20.3	15.4	21.8	16.	22.6	16.6	23.4	17.4	24.4	18.1	25.6	18.8	26.8		
0 10	15.4	30.8	16.2	32.2	16.9	33.8	17.8	35.3	18.1	36.2	18.8	37.6	19.7	39.4	20.3	41.3	21.8	43.6	22.6	45.2	23.4	46.9	24.4	48.9	25.6	51.4	26.8	53.6	0	10
11 20	30.8	46.2	32.2	48.5	33.8	50.6	35.3	52.9	36.2	54.2	37.6	56 2	39.4	59.0	41.3	61.7	43.6	65.2	45.2	67.6	46.9	70.1	48.9	73.2	51.4	76.8	53.6	80.1	11	20
21 30	46.2	61.6	48.5	64.6	50.6	67.6	52.9	70.5	54.2	72.4	56.2	75.0	59.0	78.7	61.7	82.4	65.2	87.	67.6	90.2	70.1	93.5	73.2	97.5	76.8	103.	80.1	107	21	30
31 40	61.6	77.0	64.6	80.7	67.6	84.5	70.5	88.0	72.4	90.4	75.0	93.6	78.7	98.5	82.4	103.	87.	109.	90.2	113.	93.5	117.	97.5	122.	103.	128.	107.	134.	31	40
41 50	77.0	92.5	80.7	97.	84.5	102.	88.	106.	90.4	109.	93.6	113.	98.5	118.	103.	124.	109.	131.	113.	136.	117.	140.	122.	147.	128.	154.	134.	161.	41	50
51 60	92.5	108.	97.	113.	102.	118.	106.	123.	109.	126.	113.	131.	118.	138.	124.	144.	131.	152.	136.	158.	140.	164.	147.	171.	154.	179.	161.	187.	51	60
61 70	108.	123.	113.	129.	118.	135.	123.	141.	126.	145.	131.	150.	138.	158.	144.	165.	152.	174.	158.	181.	164.	187.	171.	195.	179.	203.	187.	214.	61	70
71 80	123.	139.	129.	146.	135.	152.	141.	159.	145.	163.	150.	169.	158.	177.	165.	186.	174.	196.	181.	204.	187.	211.	195.	220.					71	80
81 90	139.	154.	146.	162.	152.	169.	159.	178.	163.	181.	169.	188.	177.	197.	186.	206.	196.	218.											81	90
91 100	154.	169.	162.	178.	169.	186.	178.	194.	181.	199.	188.	206.	197.	217.															91	100
101 110	169.	185.	178.	193.	186.	202.	194.	211.	199.	217.																			101	110
111 120	185.	201.	193.	211.																									111	120
121 130																													121	130
131 140																													131	140
141 150																													141	150
151 160																													151	160
161 170	Two 0-10 means that two 0-10 orifices are to be placed in the radiators, one in each union.																												161	170

Vapor Rating of Orifice	Section 2 — Height Above Midpoint of Heater in Feet																										Section 2	Vapor Rating of Orifice
	4½	5			6	7		8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18		
Two 0-10																	6.9	9.7	7.2	10.1	7.4	10.5	7.8	10.9	8.	11.2	8.2	11.6	Two 0-10	
0 10	5.8	11.6	6.4	13.0	7.1	14.1	7.6	15.1	8.1	16.1	8.6	17.	9.1	18.	9.5	18.8	9.7	19.4	10.1	20.2	10.5	21.	10.9	21.8	11.2	22.5	11.6	23.2	0	10
11 20	11.6	17.2	13.0	18.6	14.1	20.4	15.1	22.	16.1	24.1	17.	25.5	18.	26.8	18.8	28.1	19.4	29.1	20.2	30.3	21.	31.4	21.8	32.8	22.5	33.6	23.2	34.7	11	20
21 30	17.2	22.1	18.6	25.5	20.4	27.8	22.	30.	24.1	32.	25.5	33.7	26.8	35.6	28.1	37.6	29.1	38.9	30.3	40.4	31.4	42.	32.8	43.4	33.6	44.9	34.7	46.3	21	30
31 40	22.1	28.4	25.5	31.0	27.8	34.1	30.	37.	32.	39.5	33.7	42.	35.6	43.9	37.6	46.	38.9	48.5	40.4	50.5	42.	52.4	43.4	54.2	44.9	56.	46.3	57.8	31	40
41 50	28.4	33.4	31.0	37.4	34.1	41.	37.	43.8	39.5	47.	42.	50.	43.9	52.5	46.	55.6	48.5	58.2	50.5	60.6	52.4	63.	54.2	65.1	56.	67.4	57.8	69.5	41	50
51 60	33.4	38.8	37.4	42.5	41.	48.3	43.8	53.6	47.	55.6	50.	59.	52.5	62.9	55.6	64.7	58.2	67.9	60.6	70.7	63.	73.4	65.1	75.9	67.4	78.5	69.5	81.	51	60
61 70	38.8	44.5	42.5	50.	48.3	55.1	53.6	59.5	55.6	63.2	59.	67.	62.9	71.	64.7	74.4	67.9	77.6	70.7	80.8	73.4	83.8	75.9	86.8	78.5	89.6	81.	92.5	61	70
71 80	44.5	50.8	50.	56.8	55.1	62.3	59.5	66.6	63.2	71.3	67.	75.6	71.	80.	74.4	82.8	77.6	87.5	80.8	91.	83.8	94.5	86.8	97.7	89.6	101.	92.5	104.	71	80
81 90	50.8	56.5	56.8	63.	62.3	68.5	66.6	74.1	71.3	79.2	75.6	82.6	80.	90.3	82.8	93.5	87.5	97.3	91.	101.	94.5	105.	97.7	109.	101.	112.	104.	116.	81	90
91 100	56.5	62.	63.	68.6	68.5	75.3	74.1	81.	79.2	87.7	82.6	93.1	90.3	98.	93.5	103.	97.3	107.	101.	111.	105.	115.	109.	119.	112.	123.	116.	127.	91	100
101 110	62.	66.6	68.6	75.	75.3	81.	81.	89.6	87.7	95.7	93.1	102.	98.	107.	103.	112.	107.	117.	111.	121.	115.	126.	119.	131.	123.	135.	127.	139.	101	110
111 120	66.6	69.4	75.	78.5	81.	89.6	89.6	98.5	95.7	104.	102.	110.	107.	116.	112.	122.	117.	126.	121.	131	126.	136.	131.	141.	135.	146.	139.	151.	111	120
121 130	69.4	74.5	78.5	87.9	89.6	96.3	98.5	104.	104.	111.	110.	118.	116.	124.	122.	130.	126.	136.	131.	141.	136.	147.	141.	152.	146.	157.	151.	162.	121	130
131 140	74.5	81.	87.9	90.6	96.3	100.	104.	108.	111.	116.	118.	123.	124.	129.	130.	133.	136.	145.	141.	152.	147.	157.	152.	163.	157.	168.	162.	174.	131	140
141 150	81.	90.1	90.6	100.1	100.	110.	108.	119.	116.	127.	123.	133.	129.	140.	133.	147.	145.	155.	152.	162.	157.	168.	163.	174.	168.	179.	174.	185.	141	150
151 160	90.1	96.	100.1	106.9	110.	117.	119.	127.	127.	132.	133.	141.	140.	149.	147.	156.	155.	165.	162.	172.	168.	179.	174.	185.	179.	191.	185.	197.	151	160
161 170	96.	101.5	106.5	112.	117.	124.	127.	131.	132.	140.	141.	149.	149.	158.	156.	166.	165.	175.	172.	182.	179.	189.	185.	196.	191.	202.	197.	209.	161	170
½	102.	128.	114.	138.	125.	152.	131.	166.	141.	178.	150.	190.	159.	200.	166.	210.	175.	221.	182.	230.	189.	239.	196.	247.					½	
⅝	128.	151.	138.	172.	152.	189.	166.	204.	178.	220.	190.	234.																	⅝	
⅞	151.	184.	172.	208.	189.	228.																							⅞	
1⅛	184.	219.																											1⅛	

	18	20	20	22	22	24	24	26	26	28	28	30	30	33	33	36	36	40	40	43	43	46	46	50	50	55	55	60		
Two 0-10	8.7	12.3	9.1	12.9	9.6	13.5	10.	14.1	10.3	14.6	10.7	15.3	11.3	15.9	11.8	16.9	12.4	17.6	12.9	18.3	13.4	18.9	14.	19.8	14.7	20.7	15.3	21.6	Two 0-10	
0 10	12.3	24.6	12.9	25.8	13.5	27.	14.1	28.2	14.6	29.2	15.3	30.4	15.9	31.8	16.9	33.8	17 6	35.2	18.3	36.6	18.9	37.8	19.8	39.5	20.7	41.5	21.6	43.3	0	10
11 20	24.6	36.8	25.8	38.6	27.	40.5	28.2	42.7	29.2	43.9	30.4	45.5	31.8	47.7	33.8	50.5	35.2	52.6	36.6	55.7	37.8	56.6	39.5	59.1	41.5	62.	43.3	64.9	11	20
21 30	36.8	49.	38.6	51.5	40.5	54.	42.7	56.2	43.9	58.5	45.5	61.6	47 7	63.6	50.5	67.5	52.6	70.2	55.7	73.	56.6	75.5	59.1	78.9	62.	82.6	64.9	86.5	21	30
31 40	49.	61.1	51.5	64.3	54.	67.3	56.2	70.2	58.5	73.	61.6	75.6	63.6	79.5	67.5	84.2	70.2	87.6	73.	91.2	75.5	94.3	78.9	98.5	82.6	103.	86.5	108.	31	40
41 50	61.1	73.5	64.3	77.2	67.3	81.	70.2	84.4	73.	87.6	75.6	91.	79.5	95.5	84.2	101.	87.6	105.	91.2	110.	94.3	113.	98.5	118.	103.	124.	108.	130.	41	50
51 60	73.5	85.5	77.2	90.	81.	94.2	84.4	99.3	87.6	102.	91.	106.	95.5	111.	101.	118.	105.	123.	110.	127.	113.	132.	118.	138.	124.	145.	130.	151.	51	60
61 70	85.5	98.	90.	103.	94.2	108	99.3	112.	102.	117.	106.	121.	111.	127.	118.	135	123.	140.	127.	146.	132.	151.	138.	158.	145.	165.	151.	173.	61	70
71 80	98.	110.	103.	116.	108.	122.	112.	127.	117.	132.	121.	137.	127.	143.	135.	152.	140.	158.	146.	165.	151.	170.	158.	178.	165.	186.	173.	195.	71	80
81 90	110.	123.	116.	129.	122.	135.	127.	141.	132.	146.	137.	152.	143.	159.	152.	169.	158.	176.	165.	183.	170.	189.	178.	198.	186.	207.	195.	216.	81	90
91 100	123.	135.	129.	142.	135.	148.	141.	154.	146.	160.	152.	167.	159.	175.	169.	185.	176.	193.	183.	205.	189.	208.	198.	217.					91	100
101 110	135.	147.	142.	154.	148.	162.	154.	169.	160.	175.	167.	182.	175.	191.	185.	202.	193.	211.											101	110
111 120	147.	159.	154.	167.	162.	176.	169.	183.	175.	190.	182.	197.	191.	207.															111	120
121 130	159.	171.	167.	180.	176.	188.	183.	197.	190.	204.	197.	212.																	121	130
131 140	171.	184.	180.	193.	188.	202.	197.	211.																					131	140
141 150	184.	196.	193.	206.																									141	150
151 160	196.	210.																											151	160
161 170																													161	170
½																													½	
⅝																													⅝	
⅞																													⅞	
1⅛																													1⅛	

Table 6—Capacities in Square Feet of Direct Radiation of Orifices Designed for Vapor Systems—Continued

Vapor Rating of Orifice	Section 3		Height Above Midpoint of Heater in Feet																		Section 3		Vapor Rating of Orifice
	4½	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	
Two 0–10																													Two 0–10
0 10	4.2	8.5	4.8	9.5	5.2	10.5	5.7	11.4	6.1	12.2	6.5	13.0	6.8	13.7	7.2	14.4	7.3	14.6	7.6	15.2	8.	15.8	8.2	16.5	8.5	17.1	8.8	17.6	0 10
11 20	8.5	12.7	9.5	14.3	10.5	15.3	11.4	16.7	12.2	18.0	13.0	19.2	13.7	20.2	14.4	21.0	14.6	21.9	15.2	22.8	15.8	23.8	16.5	24.7	17.1	25.5	17.6	26.3	11 20
21 30	12.7	16.3	14.3	18.4	15.3	20.4	16.7	21.5	18.0	24.0	19.2	25.6	20.2	27.0	21.0	28.4	21.9	29.1	22.8	30.4	23.8	31.6	24.7	32.9	25.5	34.	26.3	35.1	21 30
31 40	16.3	20.2	18.4	22.0	20.4	25.6	21.5	27.8	24.0	29.9	25.6	31.7	27.0	33.2	28.4	34.9	29.1	36.4	30.4	38.0	31.6	39.6	32.9	41.1	34.	42.5	35.1	43.8	31 40
41 50	20.2	24.4	22.0	27.7	25.6	30.6	27.8	33.2	29.9	35.1	31.7	37.5	33.2	39.8	34.9	42.0	36.4	43.6	38.0	45.6	39.6	47.5	41.1	49.4	42.5	51.	43.8	52.6	41 50
51 60	24.4	28.4	27.7	32.1	30.6	34.8	33.2	38.0	35.1	41.9	37.5	43.6	39.8	44.6	42.0	49.2	43.6	50.9	45.6	53.1	47.5	55.4	49.4	57.5	51.	59.5	52.6	61.4	51 60
61 70	28.4	32.5	32.1	35.7	34.8	39.7	38.0	43.5	41.9	47.4	43.6	50.5	44.6	53.5	49.2	56.4	50.9	58.2	53.1	60.9	55.5	63.4	57.5	65.6	59.5	68.	61.4	70.2	61 70
71 80	32.5	34.9	35.7	40.1	39.7	43.6	43.5	49.5	47.4	53.4	50.5	56.9	53.5	60.2	56.4	63.2	58.2	65.6	60.9	69.5	63.4	71.4	65.6	74.0	68.	76.6	70.2	78.	71 80
81 90	34.9	38.8	40.1	43.6	43.6	50.4	49.5	55.0	53.4	59.2	56.9	63.2	60.2	66.4	63.2	69.8	65.6	73.0	69.5	76.1	71.4	79.4	74.0	82.4	76.6	85.1	78.	88.	81 90
91 100	38.8	42.6	43.6	49.6	50.4	55.4	55.0	60.3	59.2	64.1	63.2	68.5	66.4	72.6	69.8	76.5	73.0	80.0	76.1	83.6	79.4	87.0	82.4	90.4	85.1	93.5	88.	96.	91 100
101 110	42.6	47.6	49.6	54.4	55.4	60.5	60.3	65.1	64.1	70.2	68.5	75.0	72.6	79.5	76.5	83.5	80.0	87.4	83.6	91.2	87.0	95.0	90.4	98.5	93.5	102.	96.5	105.	101 110
111 120	47.6	51.5	54.4	58.7	60.5	64.1	65.1	70.2	70.2	75.8	75.0	81.0	79.5	83.5	83.5	91.0	87.4	94.6	91.2	99.0	95.0	106.	98.5	107.	102.	111.	105.	114.	111 120
121 130	51.5	55.5	58.7	63.2	64.1	68.1	70.2	75.8	75.8	81.0	81.0	88.2	83.5	93.4	91.0	98.0	94.6	104.	99.0	106.	106.	111.	107.	115.	111.	119.	114.	123.	121 130
131 140	55.5	59.5	63.2	66.5	68.1	74.1	75.8	81.0	81.0	88.6	88.2	94.5	93.4	100.	98.0	105.	104.	109.	106.	114.	111.	119.	115.	123.	119.	127.	123.	131.	131 140
141 150	59.5	63.2	66.5	71.0	74.1	79.2	81.0	87.9	88.6	94.5	94.5	101.	100.	107.	105.	112.	109.	116.	114.	122.	119.	127.	123.	132.	127.	136.	131.	140.	141 150
151 160	63.2	65.5	71.0	75.5	79.2	82.5	87.9	93.4	94.5	100.	101.	107.	107.	113.	112.	116.	116.	124.	122.	129.	127.	135.	132.	140.	136.	145.	140.	149.	151 160
161 170	65.5	69.5	75.5	80.0	82.5	84.8	93.4	99.0	100.	106.	107.	113.	113.	120.	116.	126.	124.	131.	129.	137.	135.	143.	140.	148.	145.	153.	149.	158.	161 170
½	69.5	90.1	80.0	103.	84.8	115.	99.0	125.	106.	131.	113.	139.	120.	147.	126.	151.	131.	166.	137.	173.	143.	180.	148.	187.	153.	194.	158.	200.	½
⅞	90.1	111.	103.	127.	115.	134.	125.	147.	131.	157.	139.	172.	147.	183.	151.	194.	166.	205.	173.	214.	180.	222.	187.	231.	194.	239.			⅞
1	111.	134.	127.	143.	134.	162.	147.	178.	157.	193.	172.	207.	183.	220.	194.	232.													1
1¼	134.	145.	143.	172.	162.	193.	178.	213.	193.	230.																			1¼
1½	145.	200.	172.	234.	193.	263.																							1½

	18	20	20	22	22	24	24	26	26	28	28	30	30	33	33	36	36	40	40	43	43	46	46	50	50	55	55	60	
Two 0–10			7.	9.8	7.3	10.3	7.6	10.8	7.9	11.2	8.2	11.6	8.7	12.2	9.1	12.8	9.6	13.5	10.	14.1	10.3	14.6	10.8	15.2	11.3	16.	13.5	16.8	Two 0–10
0 10	9.3	18.6	9.8	19.6	10.3	20.8	10.8	21.5	11.2	22.4	11.6	23.2	12.2	24.3	12.8	25.6	13.5	27.1	14.1	28.2	14.6	29.2	15.2	30.4	16.	32.	16.8	33.5	0 10
11 20	18.6	27.9	19.6	29.4	20.8	30.9	21.5	32.3	22.4	33.5	23.2	34.8	24.3	36.6	25.6	38.4	27.1	40.7	28.2	42.1	29.2	43.7	30.4	45.7	32.	48.	33.5	50.1	11 20
21 30	27.9	37.2	29.4	39.2	30.9	41.2	32.3	43.8	33.5	44.6	34.8	46.5	36.6	48.8	38.4	51.2	40.7	54.1	42.1	56.2	43.7	58.2	45.7	60.8	48.	63.8	50.1	66.9	21 30
31 40	37.2	46.4	39.2	49.	41.2	51.5	43.8	53.8	44.6	55.8	46.5	58.0	48.8	61.	51.2	63.8	54.1	67.6	56.2	70.2	58.2	72.6	60.8	76.	63.8	79.7	66.9	83.5	31 40
41 50	46.4	55.7	49.	59.	51.5	61.8	53.8	64.6	55.8	67.0	58.0	69.6	61.	73.3	63.8	76.7	67.6	81.2	70.2	84.4	72.6	86.4	76.	91.3	79.7	95.	83.5	100.	41 50
51 60	55.7	65.	59.	68.5	61.8	72.	64.6	75.2	67.	78.	69.6	81.1	73.3	85.4	76.7	89.4	81.2	94.5	84.4	98.1	86.4	102.	91.3	106.	95.	112.	100.	117.	51 60
61 70	65.	74.4	68.5	78.4	72.	82.4	75.2	86.0	78.	89.4	81.1	92.8	85.4	97.6	89.4	102.	94.5	108.	98.1	112.	102.	116.	106.	122.	112.	128.	117.	134.	61 70
71 80	74.4	83.6	78.4	88.3	82.4	92.8	86.	97.	89.4	100.	92.8	105.	97.6	110.	102.	115.	108.	122.	112.	127.	116.	131.	122.	137.	128.	143.	134.	151.	71 80
81 90	83.6	93.	88.3	98.1	92.8	103.	97.	108.	100.	112.	105.	116.	110.	122.	115.	128.	122.	136.	127.	141.	131.	146.	137.	152.	143.	160.	151.	168.	81 90
91 100	93.	102.	98.1	108.	103.	113.	108.	118.	112.	123.	116.	127.	122.	134.	128.	141.	136.	150.	141.	154.	146.	160.	152.	167.	160.	176.	168.	184.	91 100
101 110	102.	112.	108.	117.	113.	124.	118.	129.	123.	134.	127.	139.	134.	147.	141.	154.	150.	162.	154.	169.	160.	175.	167.	182.	176.	191.	184.	200.	101 110
111 120	112.	121.	117	127.	124.	134.	129.	140.	134.	145.	139.	151.	147.	159.	154.	166.	162.	176.	169.	183.	175.	189.	182.	198.	191.	208.			111 120
121 130	121.	130.	127.	137.	134.	144.	140.	150.	145.	156.	151.	162.	159.	171.	166.	179.	176.	189.	183.	196.	189.	204.	198.	212.					121 130
131 140	130.	139.	137.	147.	144.	155.	150.	161.	156.	168.	162.	174.	171.	183.	179.	192.	189.	203.	196.	211.									131 140
141 150	139.	149.	147.	157.	155.	165.	161.	172.	168.	179.	174.	185.	183.	195.	192.	204.													141 150
151 160	149.	158.	157.	167.	165.	175.	172.	183.	179.	190.	185.	199.	195.	208.															151 160
161 170	158.	167.	167	177.	175.	185.	183.	194.	190.	201.	199.	209.																	161 170
½	167.	212.	177.	223.	185.	234.	194.	245.																					½
⅞																													⅞
1																													1
1¼																													1¼
1½																													1½

Vapor Rating of Orifice	Section 4		Height Above Midpoint of Heater in Feet																		Secton 4		Vapor Rating of Orifice
	4½–5		5–6		6–7		7–8		8–9		9–10		10–11		11–12		12–13		13–14		14–15		15–16		16–17		17–18		
0–10	2.9-	5.8	3.3-	6.7	3.7-	7.4	4.0-	8.1	4.3-	8.7	4.6-	9.3	4.9-	9.8	5.1-	10.4	5.2-	10.5	5.3-	10.7	5.5-	10.9	5.7-	11.4	5.9-	11.9	6.1-	12.3	0–10
11–20	5.8-	8.7	6.7-	10.0	7.4-	11.1	8.1-	12.1	8.7-	13.0	9.3-	13.9	9.8-	14.7	10.4-	15.0	10.5-	15.2	10.7-	15.6	10.9-	16.3	11.4-	17.0	11.9-	17.7	12.3-	18.4	11-20
21–30	8.7-	10.7	10.0-	13.3	11.1-	14.8	12.1-	15.3	13.0-	16.5	13.9-	17.7	14.7-	18.9	15.0-	20.0	15.2-	20.2	15.6-	20.8	16.3-	21.8	17.0-	22.8	17.7-	23.6	18.4-	24.5	21–30
31–40	10.7-	14.5	13.3-	15.4	14.8-	17.2	15.3-	19.0	16.5-	20.6	17.7-	21.0	18.9-	22.6	20.0-	25.6	20.2-	24.7	20.8-	25.9	21.8-	27.2	22.8-	28.4	23.6-	29.5	24.5-	30.6	31–40
41–50	14.5-	15.5	15.4-	18.1	17.2-	20.7	19.0-	21.3	20.6-	23.4	21.0-	26.8	22.6-	28.3	25.6-	30.0	24.7-	30.3	25.9-	31.2	27.2-	32.7	28.4-	34.0	29.5-	35.4	30.6-	36.8	41–50
51–60	15.5-	18.1	18.1-	21.0	20 7-	22.1	21.3-	26.4	23.4-	28.8	26.8-	31.0	28.3-	33.0	30.0-	33.8	30.3-	34.7	31.2-	36.4	32.7-	38.1	34.0-	40.2	35.4-	41.3	36.8-	42.9	51–60
61–70	18.1-	20.7	21.0-	24.2	22.1-	27.6	26 4-	32.0	28.8-	33.0	31.0-	34.1	33.0-	36.4	33.8-	38.6	34.7-	39.6	36.4-	41.7	38.1-	43.5	40.2-	45.4	41.3-	47.3	42.9-	49.0	61–70
71–80	20.7-	23.4	24.2-	27.4	27.6-	31.0	32.0-	33.2	33.0-	35.6	34.1-	38.4	36.4-	41.0	38.6-	43.6	39.6-	44.7	41.7-	47.0	43.5-	49.0	45.4-	51.2	47.3-	53.3	49.0-	55.2	71–80
81–90	23.4-	26.0	27.4-	30.6	31.0-	33.2	33.2-	36.2	35.6-	39.6	38.4-	42.7	41.0-	44.4	43.6-	47.0	44.7-	49.7	47.0-	52.3	49.0-	54.5	51.2-	57.0	53.3-	59.2	55.2-	61.4	81–90
91–100	26.0-	28.4	30.6-	33.2	33.2-	35.5	36.2-	39.6	39.6-	43.5	42.7-	45.2	44.4-	51.0	47.0-	54.0	49.7-	54.5	52.3-	57.4	54.5-	59.7	57.0-	62.4	59.2-	65.0	61.4-	67.4	91–100
101–110	28.4-	31.0	33.2-	33.6	35.5-	38.7	39.6-	43.4	43.5-	45.8	45.2-	52.1	51.0-	55.6	54.0-	58.9	54.5-	59.4	57.4-	62.6	59.7-	65.2	62.4-	68.0	65.0-	71.0	67.4-	73.5	101–110
111–120	31.0-	33.0	33.6-	36.4	38.7-	41.9	43.4-	44.5	45.8-	52.6	52.1-	56.6	55.6-	60.4	58.9-	63.2	59.4-	64.5	62.6-	68.0	65.2-	71.0	68.0-	73.8	71.0-	77.0	73.5-	80.0	111–120
121–130	33.0-	34.0	36.4-	39.1	41.9-	43.6	44.5-	51.9	52.6-	56.5	56.6-	60.8	60.4-	63.5	63.2-	67.4	64.5-	69.3	68.0-	73.0	71.0-	76.0	73.8-	79.4	77.0-	82.6	80.0-	85.6	121–130
131–140	34.0-	35.0	39.1-	41.8	43.6-	45.4	51.9-	55.4	56.5-	60.5	60.8-	63.6	63.5-	68.1	67.4-	72.6	69.3-	74.3	73.0-	78.8	76.0-	81.4	79.4-	85.0	82.6-	88.7	85.6-	91.9	131–140
141–150	35.0-	36.6	41.8-	43.6	45.4	53.4	55.4-	59.3	60.5-	63.2	63.6-	68.0	68.1-	72.6	72.6-	77.1	74.3-	79.2	78.0-	83.5	81.4-	87.0	85.0-	91.0	88.7-	94.5	91.9-	98.0	141–150
151–160	36.6-	38.8	43.6-	45.0	53.4-	55.0	59.3-	58.4	63.2-	64.4	68.0-	70.0	72.6-	75.2	77.1-	80.0	79.2-	84.3	83.5-	88.0	87.0-	92.0	91.0-	96.0	94.5-	101.	98.0-	106.	151–160
161–170	38.8-	41.2	45.0-	46.1	55.0-	60.1	58.4-	64 5	64.4-	70.8	70.0-	76.4	75.2-	81.9	80.0-	82.3	84.3-	89.4	88.0-	94.0	92.0-	98.0	96.0-	102.	101.-106.		106.-110.		161–170
½″	41.2-	45.2	46.1-	64.0	60.1-	72.8	64.5-	81.5	70.-8	91.8	76.4-	98.5	81.9-105.		82.3-111.		89.4-113.		94.0-118.		98.0-124.		102.	-131.	106.-	137.	110.-143.		½″
⅝″	45.2-	63.2	64.0-	77.6	72.8-	79.0	81.5-104.		91.8-113.		98.5-123.		105.	-130.	111.	-136.	113.	-138.	118.	-147.	124.	-153.	131.	-160.	137.	-166.	143.	-172.	⅝″
¾″	63.2-	76.2	77.6-	95.2	79.0-	112.	104.	-125.	113.	-136.	123.	-137.	130.	-146.	136.	-157.	138.	-168.	147.	-177.	153.	-184.	160.	-193.	166.	-201.	172.	-208.	¾″
1″	76.2-	97.2	95.2-117.		112.	-134.	125.	-133.	136.	-148.	137.	-163.	146.	-176.	157.	-187.	168.	-201.	177.	-211.	184.	-221.	193.	-231.					1″
1¼″	97.2-132.		117.	-131.	134.	-158.	133.	-184.	148.	-201.	163.	-220.	176.	-238.	187.	-254.													1¼″
1½″	132.-	152.	131.	-191.	158.	-210.	184.	-240.																					1½″
2″	152.-	191.	191.	-252.																									2″

	18—20	20—22	22—24	24—26	26—28	28—30	30—33	33—36	36—40	40—43	43—46	46—50	50—55	55—60	
0–10	6.5- 13.1	6.9- 13.8	7.3- 14.6	7.7- 15.3	8.0- 16.0	8.3- 16.5	8.8- 17.5	9.2- 18.4	9.8- 19.6	10.1- 20.7	10.5- 21.0	11.1- 22.0	11.6- 23.1	12.1- 24.1	0–10
11–20	13.1- 19.6	13.8- 20.7	14.6- 21.8	15.3- 23.0	16.0- 23.9	16.5- 24.8	17.5- 26.1	18.4- 27.4	19.6- 29.2	20.7- 30.2	21.0- 31.4	22.0- 33.0	23.1- 34.6	24.1- 36.1	11–20
21–30	19.6-26.5	20.7- 27.6	21.8- 29.1	23.0- 30.6	23.9- 31.9	24.8- 33.0	26.1- 35.0	27.4- 36.6	29.2- 39.0	30.2- 40.5	31.4- 42.0	33.0- 44.0	34.6- 46.1	36.1- 48.2	21–30
31–40	26.5-32.5	27.6- 35.5	29.1- 36.4	30.6- 38.2	31.9- 39.8	33.0- 41.3	35.0- 43.5	36.6- 45.7	39.0- 48.7	40.5- 50.5	42.0- 52.3	44.0- 54.8	46.1- 57.6	48.2- 60.2	31–40
41–50	32.5- 39.2	35.5- 41.5	36.4- 43.8	38.2- 45.8	39.8- 48.0	41.3- 49.5	43.5- 52.3	45.7- 55.0	48.7- 58.5	50.5- 60.5	52.3- 63.0	54.8- 66.0	57.6- 69.2	60.2- 72.5	41–50
51–60	39.2- 45.6	41.5- 48.3	43.8- 51.0	45.8- 53.4	48.0- 55.7	49.5- 57.7	52.3- 61.0	55.0- 64.0	58.5- 68.1	60.5- 70.6	63.0- 73.3	66.0- 76.9	69.2- 80.5	72.5- 84.5	51–60
61–70	45.6- 52.1	48.3- 55.4	51.0- 58.2	53.4- 61.0	55.7- 63.8	57.7- 66.0	61.0- 68.6	64.0- 7.22	68.1- 76.0	70.6- 80.7	73.3- 84.0	76.9- 87.8	80.5- 92.3	84.5- 97.2	61–70
71–80	52.1- 58.7	55.4- 62.3	58.2- 65.5	61.0- 68.9	63.8- 72.0	66.0- 74.5	68.6- 76.1	72.2- 82.5	76.0- 87.8	80.7- 91.0	84.0- 94.5	87.8- 99.0	92.3-104.	97.2-109.	71–80
81–90	58.7- 65.4	62.3- 69.3	65.5- 73.0	68.9- 76.5	72.0- 80.0	74.5- 82.9	76.1- 85.0	82.5- 91.8	87.8- 97.5	91.0-101.0	94.5-105.	99.0-110.	104. -116.	109. -121.	81–90
91–100	65.4- 71.6	69.3- 76.0	73.0- 80.0	76.5- 84.5	80.0- 87.6	82.9- 91.0	85.0- 96.0	91.8-101.	97.5-107.	101.0-111.	105. -116.	110. -121.	116. -127.	121. -133.	91–100
101–110	71.6- 78.2	76.0- 83.0	80.0- 87.3	84.5- 91.6	87.6- 95.6	91.0- 99.1	96.0-104.	101. -110.	107. -117.	111. -121.	116. -126.	121. -128.	127. -136.	133. -145.	101–110
111–120	78.2- 85.0	83.0- 90.0	87.3- 94.8	91.6- 99.5	95.6-104.	99.1-109.	104. -114.	110. -119.	117. -126.	121. -131.	126. -136.	128. -143.	136. -150.	145. -157.	111–120
121–130	85.0- 91.0	90.0- 96.8	94.8-102.	99.5-107.	104. -112.	109. -116.	114. -121.	119. -128.	126. -135.	131. -141.	136. -147.	143. -154.	150. -161.	157. -169.	121–130
131–140	91.0- 97.9	96.8-104.	102. -109.	107. -114.	112. -119.	116. -124.	121. -130.	128. -137.	135. -146.	141. -151.	147. -158.	154. -165.	161. -173.	169. -181.	131–140
141–150	97.9-104.	104. -110.	109. -116.	114. -122.	119. -128.	124. -132.	130. -140.	137. -147.	146. -155.	151. -161.	158. -168.	165. -175.	173. -184.	181. -193.	141–150
151–160	104. -111.	110. -118.	116. -124.	122. -130.	128. -135.	132. -140.	140. -149.	147. -155.	155. -164.	161. -171.	168. -179.	175. -187.	184. -196.	193. -205.	151–160
161–170	111. -117.	118. -124.	124. -131.	130. -137.	135. -144.	140. -148.	149. -156.	155. -165.	164. -173.	171. -181.	179. -189.	187. -198.	196. -207.		161–170
½″	117. -150.	124. -158.	131. -166.	137. -174.	144. -182.	148.- 190.	156. -200.	165. -210.	173. -.220	181. -229.	189. -239.	198. -250.			½″
⅝″	150. -183.	158. -194.	166. -202	174. -214.	182. -224.	190. -231.									⅝″
¾″	183. -220.	194 -235.													¾″
1″															1″
1¼″															1¼″
1½″															1½″
2″															2″

even among radiators on the same floor because some of the radiators are taller than others. The numbers in column 4 of the tabulation represent the number of square feet of radiation furnished by each radiator. Number 11, for instance, has 160 sq. ft., No. 10 has 24 sq. ft. and so on down the column.

The numbers in column 5 represent the number of square feet of radiation that the section of the mains immediately preceding the radiator must carry. Thus, the mains immediately preceding No. 11 must carry 160 sq. ft., the section preceding No. 10, 184 sq. ft. and that preceding No. 9, 249 sq. ft. Each number in this column is obtained by adding together the number on its left and the number immediately above it. Thus, 184 is obtained by adding 24 to 160, 249 is obtained by adding 65 to 184, and 270 is obtained by adding 21 to 249. The only exceptions to this are 676 and 981. These represent the number of square feet that must be carried by a section immediately preceding a junction. They are obtained by adding together the numbers of square feet carried by each branch. Thus, 676 is obtained by adding 208 to 468, and 981 is obtained by adding 230 to 751.

The numbers in columns 6 and 7 are riser sizes. They are obtained by selecting the sizes from Table 1 that correspond to the number of square feet for each radiator as given in column 4. The numbers in columns 8 and 9 are the sizes of the mains for the sections whose capacities are given in column 5. In this system the height from the mid-point of the heater to the mid-point of the lowest portion of the mains is 3 ft. 6 in. Therefore, Table 2 is used to determine the sizes of the mains.

The length of a branched line must always be measured along the longest branch; consequently the length

Table 7—Setting of Valves Calibrated in Square Feet of Radiation

Square Feet of Radiation	Section 1 — Height Above Midpoint of Heater in Feet																												Square Feet of Radiation
	4½–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	18–20	20–22	22–24	24–26	26–28	28–30	30–33	33–36	36–40	40–43	43–46	46–50	50–55	55–60	
10	13	12	11	10	10	9	9																						10
15	20	18	16	15	14	14	13	13	12	12	11	11	11	10	10	9	9	8											15
20	27	24	22	21	20	19	18	17	16	16	15	15	14	14	13	12	12	11	11	11	10	10	9	9	9				20
25	33	30	28	26	24	23	22	21	20	19	18	18	18	17	16	15	15	14	14	13	13	12	11	11	11	10	10	9	25
30	40	36	33	31	29	28	26	25	24	23	22	22	21	21	19	18	18	17	17	16	15	15	14	13	13	12	12	11	30
35	47	43	39	36	34	32	30	29	28	27	26	25	25	24	23	22	21	20	19	19	18	17	16	15	15	14	14	13	35
40	54	49	45	42	39	37	35	34	32	31	29	29	28	27	26	25	24	23	22	21	20	19	18	17	17	16	16	15	40
45	61	55	51	47	44	42	40	38	36	35	33	33	32	31	29	28	26	25	25	24	23	22	21	19	19	18	18	17	45
50	67	60	56	52	49	46	44	42	41	39	37	36	35	34	32	31	30	28	28	27	25	24	23	22	21	20	19	19	50
60	80	73	67	62	58	55	53	50	49	47	44	44	42	41	39	37	35	34	33	32	30	29	27	26	26	25	23	22	60
70	93	85	78	73	68	65	62	59	57	55	52	51	49	48	45	43	41	40	39	37	35	34	32	30	30	29	27	26	70
80	107	97	85	83	78	74	70	67	65	62	59	58	56	55	52	49	47	45	44	43	41	39	37	35	34	33	31	30	80
90	120	109	100	93	88	83	79	76	73	70	66	65	63	62	58	55	53	51	50	48	46	44	41	39	38	37	35	34	90
100	133	121	111	104	97	92	88	84	81	78	74	73	70	68	65	63	59	57	55	53	51	48	46	43	43	41	39	37	100
110	147	133	122	114	107	101	97	92	89	86	81	80	77	75	71	68	65	62	61	58	56	53	50	47	47	45	43	41	110
120	160	145	134	125	117	111	106	101	97	94	88	87	84	82	78	74	71	68	66	64	61	58	55	52	51	49	47	45	120
130	174	157	145	135	127	120	114	109	105	101	96	94	91	89	84	80	77	74	72	69	66	63	60	56	55	53	51	48	130
140	191	173	159	148	138	131	124	119	113	109	103	102	98	96	91	86	83	79	77	74	71	68	64	60	60	57	55	52	140
150	205	185	170	158	148	140	133	126	123	117	110	109	105	103	97	92	89	85	83	80	76	73	69	65	64	61	58	56	150
160	218	197	181	168	158	149	142	135	130	125	118	116	113	109	104	99	94	91	88	85	81	77	73	69	68	65	62	60	160
180	245	221	203	189	177	168	159	152	146	140	133	131	127	123	116	111	107	102	99	96	91	87	82	78	77	74	70	67	180
200	273	246	226	210	197	187	177	169	162	156	147	145	141	137	129	123	118	113	110	106	101	97	92	86	85	82	78	75	200

Square Feet of Radiation	Section 2 — Height Above Midpoint of Heater in Feet																												Square Feet of Radiation
	4½–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	18–20	20–22	22–24	24–26	26–28	28–30	30–33	33–36	36–40	40–43	43–46	46–50	50–55	55–60	
10	17	15	14	13	12	12	11	11	10	10	9	9	9																10
15	26	23	21	20	18	17	17	16	15	15	14	14	13	13	12	12	11	11	10	10	9	9	9						15
20	35	31	29	27	25	23	22	21	20	20	19	18	18	17	16	15	15	14	14	13	13	12	11	11	11	10	10	9	20
25	44	39	36	33	31	29	28	27	25	25	24	23	22	21	20	19	19	18	17	16	16	15	14	14	13	13	12	12	25
30	52	47	43	40	37	35	33	32	30	30	28	28	27	26	24	23	22	21	20	20	19	18	17	16	16	15	14	14	30
35	63	56	51	47	44	41	39	38	35	35	33	32	31	30	28	27	26	25	24	23	22	21	20	19	18	18	17	16	35
40	71	64	58	54	51	47	45	43	41	39	38	37	35	34	33	31	29	28	27	26	25	24	23	22	21	20	19	18	40
45	83	73	66	61	57	54	51	49	46	44	43	41	40	39	36	35	33	32	31	30	28	27	26	25	24	23	22	21	45
50	88	79	72	68	62	59	56	53	51	50	48	46	44	43	41	39	38	35	34	33	31	30	28	27	26	25	24	23	50
60	106	95	87	80	75	71	67	64	61	59	57	55	53	52	49	47	44	42	41	39	38	36	34	33	32	30	29	28	60
70	126	112	102	94	88	83	78	75	72	69	66	64	62	60	57	54	52	50	48	46	44	42	40	38	37	35	34	32	70
80	144	128	116	107	100	95	90	86	82	79	76	74	71	69	65	62	59	57	54	53	50	48	45	44	42	40	38	37	80
90	159	142	130	120	112	106	101	96	92	89	85	83	80	77	73	70	66	64	61	59	56	54	51	49	47	45	43	41	90
100	177	158	144	133	125	118	112	106	100	99	95	92	89	86	81	78	74	71	68	66	63	60	57	55	53	50	48	46	100
110	195	174	159	147	138	130	123	117	113	109	105	101	98	95	90	85	81	78	75	73	69	66	62	60	58	56	53	51	110
120	212	190	173	160	150	142	134	128	123	119	114	110	106	103	98	93	89	85	82	79	75	72	68	66	63	61	58	55	120
130	230	206	188	173	163	153	145	138	133	128	123	120	115	112	106	101	96	92	89	85	82	78	74	71	69	66	63	60	130
140	260	230	208	192	179	168	160	152	143	138	133	128	124	120	114	110	104	99	95	92	88	83	79	76	74	71	67	64	140
150	279	246	223	206	192	180	172	163	154	148	142	138	133	129	122	116	111	106	102	99	94	89	85	82	78	76	72	69	150
160	296	262	238	219	214	192	182	173	164	158	152	147	142	138	130	124	118	114	109	105	100	96	91	87	85	81	77	74	160
180	332	294	267	246	230	216	204	195	184	178	171	165	160	155	146	140	133	128	123	119	113	107	102	98	95	91	87	83	180
200									225	197	190	184	178	172	163	155	148	142	136	132	126	119	113	109	106	101	96	92	200

of the line in this case is 3 ft. + 15 ft. + 31½ ft. + 4½ ft. + 8¼ ft. + 10 ft. or 72¼ ft. Consequently, the proper number of square feet is indicated in column 3 under the column headed "70-80." Thus, for 160 sq. ft., find that a 2½ in. flow main and a 2½ in. return main are required. For 184 sq. ft. a 2½ in. flow main and a 2½ in. return main are needed and so on. The short line at the bottom of the figure is 6 ft. + 24 ft. + 3 ft. + 7 ft., or 40 ft. long. Accordingly, use the column headed "30-40" to find the sizes of its mains.

The numbers in column 10 are the sizes of the main heater risers. They are obtained by reference to Table 4 as previously. The numbers in column 11 are orifice sizes. Before these can be selected, the line must be divided into four equal sections. Since the longest branch is 72¼ ft. long, the sections will each be 18 ft. 1 in. long. This distributes the radiators among the sections as follows:

Section 1 contains radiators 1 and 2.
Section 2 contains radiators 3, 4, 5, 6, 12 and 13.
Section 3 contains radiators 7, 8, 9, and 14.
Section 4 contains radiators 10 and 11.

In the case of the small line at the bottom of the page:

Radiator 15 is in Section 1.
Radiator 16 is in Section 4.

As previously noted, the section for each radiator is recorded in column 2 of Table 8. All radiators on the first floor except No. 1 come within the range of 7-8 feet above the heater; consequently their orifice sizes are found under the heading "7-8" in the proper sections of Table 5. The orifice size for No. 1 is found in Table 5, Section 1 under the column headed "8-9."

(Continued on Page 101)

Table 7—Setting of Valves Calibrated in Square Feet of Radiation—Continued

Square Feet of Radiation	Section 3 / Height Above Midpoint of Heater in Feet																												Section 3	Square Feet of Radiation
	4½-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-20	20-22	22-24	24-26	26-28	28-30	30-33	33-36	36-40	40-43	43-46	46-50	50-55	55-60		
10	24	21	19	17	16	15	15	14	14	13	13	12	12	11	11	10	10													10
15	35	31	28	24	23	23	22	22	20	20	19	18	18	17	16	15	14	14	13	13	12	12	11	11	10	10	9	9		15
20	49	43	39	36	33	31	29	28	27	26	25	24	24	23	21	20	19	18	18	17	16	16	15	14	14	13	12	12		20
25	61	54	49	45	42	39	37	35	34	33	31	30	29	28	27	25	24	23	22	21	20	19	18	18	17	16	16	15		25
30	73	65	58	54	50	47	44	42	41	39	38	36	35	34	32	30	29	28	27	26	25	23	22	21	20	20	19	18		30
35	90	78	70	64	60	56	53	50	48	46	44½	42	41	40	37	35	33	32	31	30	29	27	26	25	24	23	22	21		35
40	106	89	80	73	68	64	60	57	55	52	50	48	47	45	43	41	39	37	36	34	33	31	29	28	27	26	25	24		40
45	121	104	92	84	78	73	69	65	61	59	57	54	53	51	48	46	43	42	40	39	37	35	33	32	31	29	28	27		45
50	125	110	99	91	84	79	74	71	68	65	63	61	59	56	53	51	48	48	45	43	41	39	37	35	34	33	31	30		50
60	150	131	119	109	101	95	89	85	82	78	75	73	70	68	64	61	58	56	53	51	49	47	44	42	41	39	37	36		60
70	181	157	141	128	119	112	105	100	96	91	88	85	82	79	75	71	68	65	62	60	57	55	51	50	48	46	44	42		70
80	207	180	161	147	136	127	120	114	110	105	100	97	94	90	85	81	77	74	71	69	65	62	59	57	55	52	50	48		80
90	227	208	178	164	152	144	134	127	123	118	113	109	105	102	96	91	87	83	80	77	73	70	66	64	61	59	56	54		90
100	252	210	198	182	168	158	149	140	137	131	126	122	117	113	107	101	97	93	89	86	82	78	75	71	68	65	62	60		100
110	277	242	218	199	185	174	164	154	151	144	138	133	129	125	117	112	106	102	98	94	90	86	81	78	75	72	69	65		110
120	310	264	238	218	202	190	179	169	164	157	152	145	141	136	128	122	116	111	107	106	98	94	88	85	82	78	75	71		120
130		286	257	236	219	206	194	183	178	170	164	157	152	147	139	132	126	120	116	112	106	101	96	92	89	85	81	77		130
140			294	267	245	229	216	204	191	183	176	170	164	158	150	142	135	130	125	120	114	109	103	99	96	92	87	83		140
150			315	286	264	245	228	219	205	196	189	182	176	170	160	152	145	139	134	128	122	117	110	107	102	98	94	90		150
160				302	279	260	249	232	219	209	202	194	187	181	171	162	155	148	142	137	131	125	117	114	110	105	100	95		160
180					315	298	271	262	256	235	226	218	211	204	192	173	174	167	160	154	147	140	132	128	123	118	112	107		180
200						326	303	294	274	262	256	242	234	226	214	202	193	185	178	171	163	156	147	142	136	131	125	119		200

Square Feet of Radiation	Section 4 / Height Above Midpoint of Heater in Feet																												Section 4	Square Feet of Radiation
	4½-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-20	20-22	22-24	24-26	26-28	28-30	30-33	33-36	36-40	40-43	43-46	46-50	50-55	55-60		
10	34	30	27	24	23	22	21	20	20	19	18	18	17	16	15	14	14	13	13	12	11	11	10	10	10	9	9	8		10
15	52	45	41	37	34	32	31	30	30	29	27	26	25	24	23	22	20	20	19	18	17	16	15	15	14	14	13	12		15
20	77	65	58	52	48	45	42	41	40	38	37	35	34	33	31	29	27	26	25	24	22	22	21	20	19	18	17	16		20
25	95	81	71	64	59	55	52	49	50	48	46	44	42	41	38	36	34	33	31	30	28	27	26	25	24	23	22	21		25
30	130	108	93	83	76	70	66	62	60	57	55	53	51	49	46	43	41	39	38	36	33	33	31	30	29	27	26	25		30
35	156	125	108	97	88	82	77	72	70	67	64	61	59	57	53	50	48	46	44	42	39	38	36	35	33	32	30	29		35
40	200	155	132	116	105	97	90	85	80	77	73	70	67	65	61	58	55	52	50	48	45	43	41	39	38	36	35	33		40
45	226	175	149	131	119	109	101	96	90	86	82	79	76	73	69	65	62	59	56	54	50	49	46	44	43	41	39	37		45
50	220	170	150	135	124	115	107	100	100	96	91	88	84	82	76	72	68	65	63	60	56	54	51	49	47	45	43	41		50
60	266	216	187	167	152	141	131	124	120	115	110	105	101	98	92	86	82	78	75	72	67	65	62	59	57	54	52	49		60
70	310	251	218	195	178	165	153	145	141	134	128	123	118	114	108	101	96	91	88	84	78	76	72	69	66	63	60	57		70
80		325	282	246	220	201	187	174	161	153	146	140	135	130	122	115	110	104	100	96	90	87	82	79	76	73	69	66		80
90			300	234	226	207	194	183	181	172	165	158	152	147	137	129	123	117	113	108	101	98	92	89	86	82	78	74		90
100				301	271	250	230	216	201	191	183	175	169	163	153	144	137	130	125	120	112	108	102	99	95	91	86	83		100
110					300	274	254	234	221	210	206	193	185	180	168	158	150	143	138	132	123	119	113	109	104	100	95	91		110
120						300	278	260	241	230	219	210	202	196	183	173	164	157	150	144	134	130	124	118	114	109	104	99		120
130							300	280	261	249	238	228	219	212	198	187	178	170	162	156	146	141	133	128	123	118	112	107		130
140								301	281	268	256	245	236	228	214	202	191	183	175	167	157	152	144	138	133	127	121	115		140
150									301	287	274	263	253	245	229	216	205	196	187	181	168	163	154	148	142	136	130	124		150
160										303	292	280	270	261	244	230	218	209	200	193	179	174	164	158	152	145	138	132		160
180											329	315	304	294	274	259	246	235	225	217	202	195	185	177	171	163	155	148		180
200															305	288	273	261	250	240	224	217	205	197	190	182	173	165		200

PLUMBING & HEATING MERCHANDISING

View of Joseph M. Griffin's display room, an integral part of his plan of "neighborhood merchandising"

A Baltimore contractor who has developed effective

Neighborhood Merchandising

Here is a plumbing and heating contractor who takes pride in his status as a "neighborhood contractor" and who is developing a nice business by taking hold of ideas which some of the main street men have found effective

JOSEPH M. GRIFFIN of Baltimore lays no claim to having developed a large business on a main thoroughfare, but can show what modern merchandising methods have enabled him to accomplish in his own neighborhood. Mr. Griffin terms himself a "neighborhood plumber," and although his section of the city has yielded sufficient work to keep him busy he is not infrequently called upon to estimate and work in other parts of the city that have been reached by his reputation and his methods of advertising.

He shows what a great field lies about the so-called neighborhood plumber when merchandising ideas are put into effect. The problems, thinks Mr. Griffin, that confront this type of plumber are somewhat different from those of the main street business man. Questions of the most advantageous mediums of advertising, types and various grades of merchandise on display, as well as the showroom itself, must all be answered differently than by those whose appeal goes out in a wider

field and who will consequently attract a diverse class of buyers.

Neighborhood Merchandising

"When the thought first came to me of trying to do some advertising in my neighborhood," states Mr. Griffin, "I placed the idea before other retailers. It would be an entire waste of time and money, they thought, to attempt advertising in the plumber's own section. Advertising or merchandising in any form to them was only for the big fellow with the extensive display. But I thought otherwise and took the chance."

This all occurred after Mr. Griffin had been in the plumbing business about eight years and saw how hard he was working to make a living out of practical plumbing exclusively. The tool shop with a few fixtures in the center of the floor seemed enough for a display and the installation of a few fixtures seemed like a "job." Of course, he was only the neighborhood plumber and no one expected more from him; but when the revolution took place within the plumbing industry and the plumber was beginning to study merchandising more closely, Mr. Griffin fell in line.

He installed an attractive display of fixtures, placed a desk in the shop for his own use, and started a real system of bookkeeping. Then he began to compile a mailing list of all the people he knew in his vicinity and added the names of any he had worked for. Since then he has made it a habit to note the names and addresses of all people he meets, as well as those that are suggested to him by customers. By these methods the number of names on his mailing list has increased steadily.

Building a Mailing List

"No matter who the person is and how remote I think he is from ever giving me a plumbing or heating job, I will always take his name and address, and if I am in his house, or if it is possible to get in, a complete description of the plumbing and heating and its condition is noted on an inspection card for future reference, as well as to be examined for 'weak spots' in special drives. Whenever an estimate is rendered, no matter to whom, the name is added to the mailing list, and a card made showing the equipment of the premises."

A great aid in making a mailing list produce, according to Mr. Griffin, is to have an inventory of the plumbing and heating in each house, and then by periodically examining the cards many leads can be found, especially for the sale of accessories and the replacement of old fixtures. The exact condition of the plumbing and heating and the needs of each house are kept continually in sight so that a reminder to the owner will many times bring inquiries that lead to sales.

Mr. Griffin says that he experimented in the beginning with different types of direct mail and also as to the most beneficial times for mailing, and he has come to the conclusion that for the plumber who is interested mainly in one particular section, a monthly mailing to every person with something of a catchy letter is most profitable. Of course,

Murphy, J. B. 1300 Battery Ave.

Fixtures	Condition	Letter / Pamphlet	Final
Basement			
Toilet	Fair	1/10/27 2/15/27 8/9/28	Repaired 1/24/28.
Laundry Tray	Good	✓	
Hot Air Heat	Bad	2/10/27 5/15/27 2/9/28 10/10/28	W-G RED JACKET 11/27/29 520# Rad. INSTALLED
1st Floor			
Sink	Good	✓	
Domestic Boiler	Good	2/10/27 3/8/28	40 Gal. Marion ins. 4/15/28
2nd Floor			
Toilet	Bad	1/15/27 2/10/27 11/23/27	S. J. Combs. ins. 1/24/28
Bath Tub	Fair	6/12/27 8/12/27 3/12/28	
Lavatory	Fair	3/10/27 4/21/27 5/12/28	
Remarks			
March 10-28 insufficient Domestic Water			

THIS card is an interesting record of progress under Mr. Griffin's system of keeping a close record of every prospect; and really studying the plumbing and heating in the home, and its condition. First note the follow-up on all items. Then, both the heating plant and the defective toilet on the second floor are replaced, and an automatic water heater installed. Of the sales opportunities presented, Mr. Griffin sold 37½% of them—counting every fixture as a possible replacement. It's really a one hundred per cent record when you consider that the three replacements really needed were made by his process of continuous and definite follow-up

ordinarily such frequent advertising would be expensive, but Mr. Griffin has bought a small mimeograph with which he claims to have done wonders. Not only is it simple to operate, so that a large quantity of letters can be turned out quickly, but also it can reproduce sketches and drawings, which makes such advertising more attractive. Every letter that goes out contains circulars of labor saving devices, accessories and descriptions of the newest in plumbing and heating, with an invitation to examine them in the showroom without any obligation.

Personalized Selling

Since an inspection card is kept of every name, it is a simple matter to thoroughly examine each one for such articles as are needed at the particular time of the year of the proposed campaign. For instance, upon the approach of spring Mr. Griffin states that every name which gives the least trace of an antiquated water heater is canvassed by direct mail for the sale of an automatic heater, and his favorite letter on such occasions shows the price range as well as the advantages. In this connection as many personal calls are made as is possible to those persons whose inspection cards point to the greatest need of such a heater. In the fall, a vigorous campaign is carried on to those prospects where steam or hot water heating is lacking, followed by a personal visit whenever possible to clinch the sale.

One of the mimeographed letters which Mr. Griffin sends out so effectively

JOSEPH M. GRIFFIN
223 E. FORT AVE.
SANITARY HEATING AND PLUMBING
BALTIMORE, MD.

THE DOLLAR YOU PAY YOUR PLUMBER
WHERE DOES IT GO?

Before he gets a penny from you, he has already spent 65 cents of every dollar you will pay him, for fixtures and materials for the job and for wages to the trained journeyman who will install them.

Twenty-five cents more of that same dollar you are to pay him, goes to pay for his store and office rent insurance and taxes, local permit and license; light, heat, telephone, water; bookkeeping and collections; maintenance of repair service truck; tools and mechanical equipment, and the other items of "overhead" which go into every modern retail business.

The remaining 10 cents in the dollar you are to pay him will represent PROFIT--providing nothing happens! And often something unlooked for happens.

The licensed, experienced Master Plumber has spent years of his life learning his trade, and strictly complies with all the wise state laws and local ordinances governing plumbing installations--for your family's health and comfort.

THE MASTER PLUMBER IS WORTHY
OF HIS HIRE

Looking into the display windows of Mr. Griffin's neighborhood store

"A personal visit," states Mr. Griffin, "after a letter of advertisement is mailed serves a two-fold purpose. First, it gains for me entrance to the home in which I can survey the plumbing and heating equipment for future information, and, secondly, it helps me to secure a more convincing argument for the merchandise that is under consideration. In order to be prepared for any argument of competitors, I always take along descriptive catalogs, pictures of the boilers, price lists and complete specifications. In this way a more logical presentation can be made, as well as certainty of the figures quoted. Other apparent necessities or defects in the heating and plumbing of the house can be brought to the attention of the owner, and in many such instances I have been greatly rewarded."

Where a campaign is carried on in the immediate or adjoining neighborhood, Mr. Griffin thinks that a good medium is the ordinary church or club program. Although he is aware, he says, that such an advertisement has not proven profitable where the advertiser is entirely out of the district, he on the other hand believes it is unexcelled for the neighborhood plumber. A very simple announcement in such a paper has made many appreciable returns for him, he claims, and the people seem to be all familiar with the advertiser. Ordinary signs with the name and address of the firm doing the plumbing work when displayed on the job to the public have brought, Mr. Griffin says, quite a few leads which have led to some nice work. This again, he states, is a type of advertising that is of greater value to the neighborhood plumber than to others because of the great tendency of neighbors to do as

their neighbors have done. People living in a particular section will constantly have the name of the contractor before them.

On the subject of competition, Mr. Griffin expresses himself rather unusually. He lays down some simple rules which, in his opinion, if carried out will entirely remove the fear of losing a job because of unfair competition.

"In order to compete," he says, "a contractor must be thoroughly acquainted with what he is trying to sell. He must know how to explain the mechanism and the operation of every part; the advantage of one accessory over another. He must come supplied with catalogs and specifications to be fully prepared to answer every question and at the same time be enabled to make comparisons with the equipment offered by the competitor. If he knows the latest in improvements, one such device may land him the job. I have had the pleasure of winning quite a few heating jobs by comparing the different weights of the boilers according to the manufacturer's specifications and outlining other technical advantages, of which every product of merit possesses at least a few to speak about. To sum up, know your subject and very much less difficulty should be experienced in convincing a prospect."

Specialty Sales

Mr. Griffin believes in the great possibilities of specialties, and especially in those of the latest innovations. Occasional "drives" are made on chromium ware, and in particular around the Christmas season, when such gifts are unsurpassed for usefulness and permanence, and enhance the beauty of the home. Such small things as bronze and silver for use on radiators, which Mr. Griffin handles, have proven a source leading to quite some business, because when prominently displayed at the proper season they attract people to the showroom who offer possible leads, as well as being prospective purchasers of all things on display. In Mr. Griffin's store can be found practically every accessory that is necessary for the ordinary residence in the heating and plumbing line, and he has tried to obtain the same recognition and understanding of his plumbing shop as the drug and grocery stores have in their respective lines in the neighborhood.

Of course Mr. Griffin places a great deal of the credit of his success on good workmanship; and he says this can only be accomplished by good workmen, who are contented and who have some other incentive than their wages. He has tried a certain plan whereby he will "split" the savings on every job that the mechanics can make by completing the particular job ahead of the estimated time; and it is not unusual to have the workmen earn quite a bonus by so doing, especially on the larger projects. Every job is inspected at least once a day by Mr. Griffin, consequently there is little chance of work being improperly completed. The appreciation by the mechanics of this bonus is shown by the manner in which they try to complete the work in the shortest time possible and in the best manner, since defective work will have to be corrected, meaning additional time consumed.

All complaints are handled directly by Mr. Griffin and no journeyman is permitted to enter into controversies with a customer for any reason. Frequently during the day Mr. Griffin will call in on the phone and get all messages so that should there be any complaints they will receive immediate service of this kind Mr. Griffin places a great deal of importance, and he has the following to say about it:

"An irritated customer, unless diplomatically handled, will be irretrievably lost; and every care should be exercised to see that the customer is satisfied. In many instances prompt response to complaints will quickly dispel any ill-feeling and prove often that the complaints are of a minor nature, easily adjusted. Usually the greatest trouble appears to be in the placing of fixtures, where a disagreement arises as to what was the arrangement agreed upon in the original contract for the installation. The unfortunate part is that these arguments usually occur after the roughing-in is completed, and sometimes when the work has progressed much further. My practice is to always lay out on the floor with chalk the exact position of the proposed installation so that the question is definitely settled and no room is left for argument on this particular point. Even if it is a residential job a sketch is made of the complete installation and submitted with the bid so that a definite idea can be had of the position of the intended installations. As can be seen from this, every thing possible is done to prevent misunderstandings, and my experience with these precautions has been that they have more than paid for the small expense and time spent."

Appropriate Displays

The neighborhood plumber, according to Mr. Griffin, must have a complete showroom containing such fixtures as are in keeping with the station in life of the people comprising his neighborhood. "Very expensive fixtures for a section of a city comprised of people of moderate means would certainly not be appropriate for display purposes in that section," states this proprietor, "and it requires only common sense to know what is needed, with allowances for the few people who are always seeking things which are above them. Too much cannot be said of the advantages of a complete accessories display. Especially is this true in my section, where the majority of the homes are owned by the occupants, who, it seems, are always in need of some modernization article, and when it is brought to their attention, and is made convenient, will usually buy."

JOSEPH M. GRIFFIN
223 E. FORT AVE.
SANITARY HEATING AND PLUMBING
BALTIMORE, MD.

CHOOSE YOUR PLUMBER
AS YOU WOULD YOUR PHYSICIAN

Ask your best friend who his physician is. He no doubt can tell you immediately the name, address and telephone number of the one chosen to guard the health of his family.

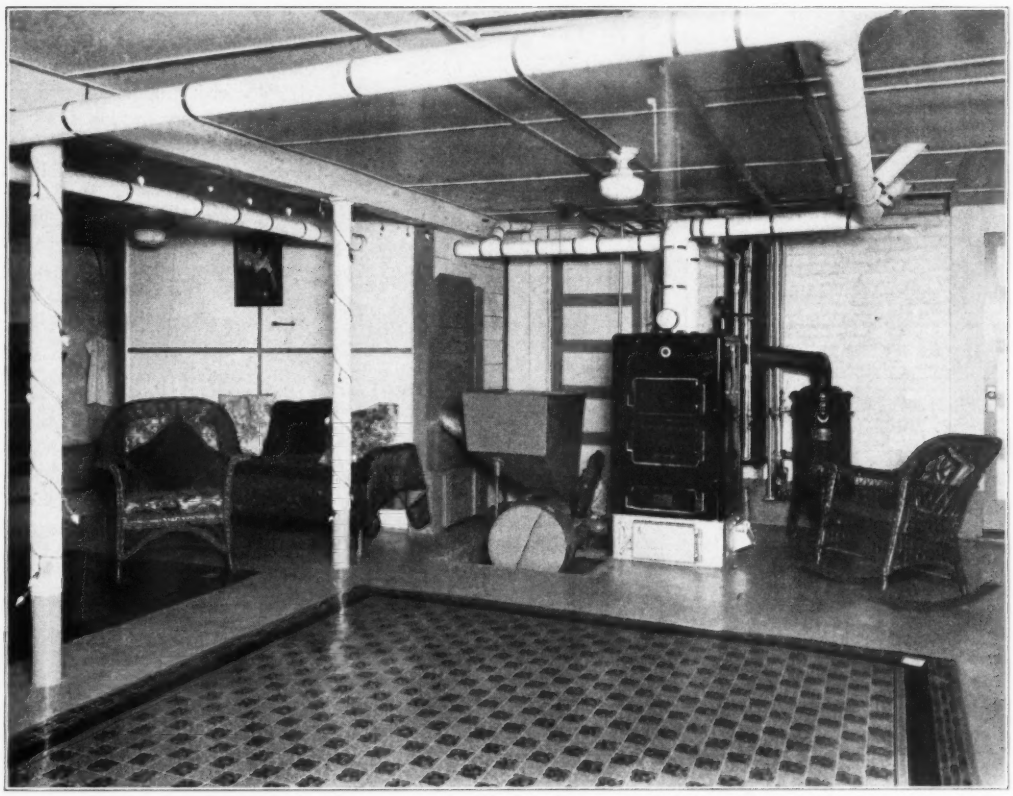
Plumbers are as necessary in safeguarding the health of your family as physicians, and your plumber should be selected with the same care.

You should know whom to call when your plumbing needs attention. You should be on intimate terms with your chosen plumber since he is the physician who will cure the ills of your sewerage, gas and water systems.

A neglected leak in your plumbing may seriously impair the health of some one of your family.

THE PLUMBER PROTECTS THE HEALTH OF THE NATION.

Another of the mimeographed letters. It also carried a drawing to illustrate the slogan



Pictures like this of actual installations help Dauphinee Co.'s salesmen convince the prospect

Another contracting firm finds profits in

Stokers *for* Homes

THE Dauphinee Co., plumbing and heating engineers of Providence, have entered quite extensively into the sale of automatic heating by coal as well as with gas-fired boilers. They handle an automatic stoker for residence heating, and feel that it is the best equipment thus far devised for controlled heating with coal.

Shortly after the war when the sale of oil burners began to be pushed with energy and gas companies became seriously interested in heating houses with gas, plumbing and heating engineers everywhere were considering the feasibility of selling either oil or gas, or both.

The Dauphinee Co. reasoned along somewhat different lines. It seemed obvious that what was selling both gas heat and oil heat was not the fuel but rather the full automatic feature. No one seemed to be giving as serious attention to the use of coal in this manner as the subject appeared to demand. However, the high pressure salesmanship being put back of sale of oil burners and the attention gas companies were giving to gas house heating was selling the idea of automatic heating. Therefore, there was a real field for a satisfactory full automatic coal burner.

Calls and Inspections

The Dauphinee Co. employs five men who visit present and prospective users and one who visits the dealers and aids them in every way possible to close sales. No high pressure salesmanship is employed, but every effort is made to have each user so thoroughly satisfied that he will say nothing but good words about his stoker and in that way aid sales. In this effort each user is called upon about three times during the heating season.

The installation is inspected. If there are any adjustments that need to be made, they are made. If there is any other attention required it is given to the installation. These are not service calls. They are calls that are made without any request being received from the user. They are more friendly in character than anything else, and most of these calls result in the securing of the name and address and perhaps a good deal of valuable information about at least one prospective user. More than one name and address may be secured on each call. In addition to all this, any possible trouble that a user might experience is anticipated and corrected before it gives him any annoyance. There is reason to believe that all the users appreciate this attention.

It is rather common practice to consider that a sale is completed when the final payment has been made on the article sold. The Dauphinee Co., however, does not consider their in-

terest ever ended in any equipment they sell, as with it they feel they are selling service. Perhaps more salesmanship is used with users than with prospective users, and it is considered good business and profitable to keep every user completely sold. If it is possible to have every single user so thoroughly satisfied that he has nothing but good words to say about the installation, then a long step has been taken toward breaking down the sales resistance. Every user then becomes a help to sell to his friends and acquaintances.

Displays appear to be the most effective advertising that is being done, although it is not possible to trace all results accurately. There are two permanent displays. One is at 1515 Broad Street, Providence, where an installation is in actual operation in the show window of the main office and display rooms of the Dauphinee Co. The other is at 244 Broad Street, Providence, where the gas equipment of the concern is handled. Displays are made at the local shows, an effective display having been made in a booth at the electric show held in the state armory last fall, for example. In addition to this it has been found that the coal companies and the heating concerns are very liberal in lending space.

In addition to the two permanent displays there are usually one or two other displays being made. As these displays are made in different sections of the sales territory, they result in a wide display circulation during the course of the year. Most people see them in one place or another. It is partly because of this that such gratifying results have been obtained from these displays.

The direct mail matter used is that secured through the co-operation of the manufacturer and the dealers. The newspaper advertising is handled in the same manner, thus reducing the cost of the advertising to the dealer and securing more effective advertising material than the dealer might be able to provide for himself. This year radio is being used, but it is somewhat too early to determine just how effective this form of advertising will prove.

Store Selling

The main office of the Dauphinee Co. occupies a large store located in a neighborhood business section on one of the most traveled streets of the city. There is a large show window on each side of the entrance. In the right window as one faces the store is the permanent display consisting of a steam boiler and the stoker. This installation is kept in actual operation during the heating season and show cards tell the passers by about it. Back of this installation comes the office and the other side of the store is used for the display for fixtures, appliances, and other items in the plumbing line that the company carries in stock. The left window is used for plumbing window displays.

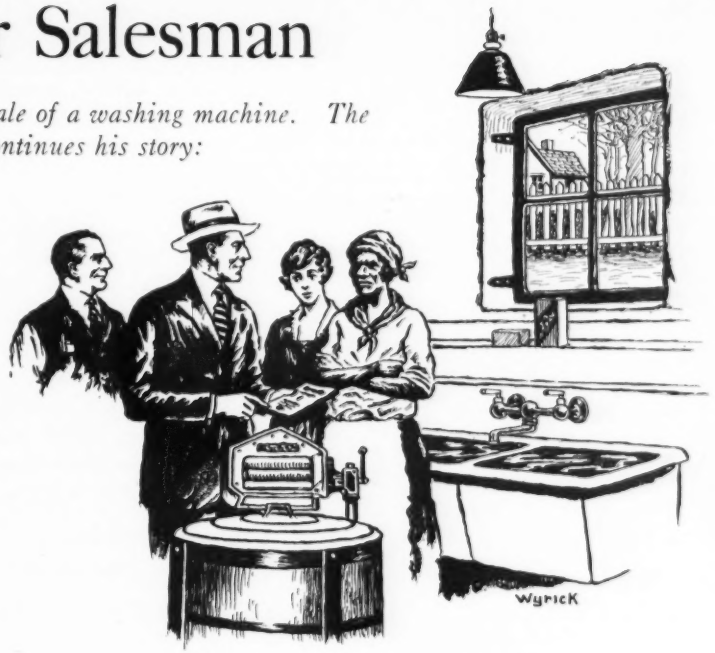
An indication of how thoroughly every customer is sold before the installation is made is indicated by the fact that between 85 and 86 per cent of the purchasers pay cash for their installations. In addition to the type of users who have been sought there appears to be two other reasons why this is the case. One is surely the appearance of the main office and sales room. It has appointments and is maintained in a condition that cannot help but inspire confidence in all those who visit it.

The other reason is that users are not forgotten when the installation is made. There is an impression among people that is far deeper than is generally realized that unless many things are paid for on the instalment plan the maximum degree of service cannot be expected. There are many people who buy on credit at large stores because they feel that they do not get as good service if they pay cash. There are people amply able to pay cash for many appliances that are bought for the home who do not do so because they take the attitude that as long as they owe something on the appliance they can rest assured that the seller will give them all the service they desire, since he will want to collect the balance. Therefore, the practice of the Dauphinee Co. is that any equipment sold by them must receive the maximum of attention after the bill is paid, and making frequent calls upon users, whether any service is required or not, results not only in securing many names of prospective users but also influences these users to pay cash in full upon installation. Otherwise, it hardly seems possible that such a high percentage of the installations would be paid in full as soon as they are completed. This confidence that is being created, therefore, not only makes more sales but it reduces deferred payments to the minimum.

A permanent window display that pays its way

The Master Salesman

The third step in the attempted sale of a washing machine. The Master Plumber continues his story:



"A dunno wha fo yo all wants with one of them washin' machines"

I HAVE just finished telling you about my evening visit with the Browns and the reception I received. When I left their home there was a very positive picture in my mind that they were satisfied they should own an electric washing machine. Their keen interest in everything I did, as I set up the machine and made the necessary connections to have it ready for work the next morning, evidenced an absolute desire for it. But when I realized the thrifty character of both of them, I knew their dread of debt was a dam to what might otherwise be a grand rush to sign up and keep the machine. These folks are different from many I know. Others would have snapped at my "investment" angle as an alibi for "buying on time." But the conservatism of this couple is more than ordinary, hence I did not build any false hopes out of my success in putting the machine in for a test.

I was up bright and early the next morning and felt ready for the battle as I started away from my house. It was Brown who admitted me, saying as he did so, "Gosh, Jones, you're sure on the job about that old washing machine, aren't you. Mrs. Brown and I talked it over after you left, even went down in the laundry and looked the machine over, but we can't make up our minds to go into debt for it."

I listened to all he said and noticed Mrs. Brown, who had entered the room in the meantime. The expression on her face showed me that she wanted that machine and had probably been talking to her husband in favor of buying it; maybe they had decided they might buy it after they saw it work. It looked as though there was a ray of encouragement for me.

After waiting to see if Mrs. Brown had anything to say, I replied to Brown, "You will remember what I said last night, Mr. Brown. If you don't want to buy the machine now, you won't buy it, and I can't compel you. But I do want you to see it actually do a washing. I tell you your automobile isn't worth any more in comfort and pleasure."

Mrs. Brown took up the conversation at that moment by saying, "Mr. Jones, did I understand you to say the price of the machine to be one hundred and forty dollars cash?" "Yes, Mrs. Brown," I replied. "That is the price"; and there something told me to say no more. Evidently she had a real interest in bringing up the price again, and it was up to me to find out in due time whether that interest in the price was a sign of leaning toward the purchase. If it was, I must learn a little bit more of what was in their minds and, if possible, a little more of what they had been saying after I left them last night.

Remembering my remark about the machine as an investment, I turned to Brown and said, "You bought some of that Commercial Air Service Common Stock, didn't you, Mr. Brown?"

"Yes," he replied. "I bought twenty-five shares of it."

"I thought I remembered you saying you had," I continued. "It hasn't paid any dividends yet, has it?"

"No," answered Brown, "and I guess it won't for another year or two. The proposition is too new as yet. But I have the confidence that they will make a good thing out of it after they get going."

"I don't doubt but that it will pay you a good return in time," I said. Then casually, "I never had much confidence in long waits for returns on stock investments. I have always been more inclined toward those that had an established dividend paying record. Of course, the market value of the stock is higher and the income probably reduced in percentage on the investment; but sometimes I think, while slower, that kind of stock is safer."

"I guess you're right about that, Jones," said Brown. "But it was only a flier of two hundred and fifty dollars and I can afford to wait for it to develop."

I had an object in asking him about his Commercial Air Service stock because he had just told me this morning in reiteration of the statement made by both of them that they didn't like debt. I remembered he had told me of borrowing from the bank to buy that stock and that he guessed he'd been foolish to allow a stock salesman to talk him into it.

About this time the laundress arrived.

"Eliza," said Mrs. Brown, "this is Mr. Jones, and he has sent this machine down here for us to try washing our clothes. If it does the work and you can manage it, we might buy one; so listen closely to

what Mr. Jones tells you and we will see how it all works out."

I watched for the effect of what Mrs. Brown said, and from the expression on Eliza's face I knew I had another selling job on my hands before she opened her mouth.

"Mis' Brown," Eliza began with a defiant look in my direction, "Ah dunno wha fo yo all wants with one of them washin' machines. That there machine's gwine to tear yo close all to pieces. Ah knows it."

"Well, now, Eliza," replied Mrs. Brown, "don't worry about it until we see it work. This one is different. But let Mr. Jones show you how it operates. Mr. Jones, you show Eliza, please."

I turned on the hot water, put in the soap and turned on the current. In a few minutes we had plenty of good soapy water and were ready to put in the clothes. Replacing the cover, I again turned on the current and, turning to Eliza, said: "Now, Eliza, if you wish, you may wring out the balance of those clothes in the wash tray and have them ready to put in the washer when this batch is done. It will take about one and one-half hours to run off each batch."

"Huh!" says Eliza, "Ah wants to see them close after theys all through buzzin' aroun' in that thing."

I laughed at this and said, "Don't you worry about that part of it. Leave it to the machine, and while you are waiting maybe Mrs. Brown could have you help her in the kitchen. Meanwhile I'll run down to the office, Mrs. Brown, and return here in time to show Eliza how to change the water for the second batch of clothes."

Brown spoke up for the first time since we began the demonstration and said, "Do you mean, Jones, that everyone can go away and leave that machine to run itself? It won't tear the clothes? Don't you have to look at the darn thing at all?"

"No, Mr. Brown," I replied. "It is better in its treatment of the clothes, your shirts, for instance, than the washboard. There is no strain or pull or hard rubbing to break the linen or cotton strands of the fabric."

"Well, it sure is a wonderful invention," he said. "I never thought much about the darn things until now. I think I'll come back myself in an hour and a half. I want to see this show finished."

With this remark we went back to the living room and, incidentally, Eliza was carrying breakfast dishes to the kitchen and started cleaning up the usual aftermath of the morning meal. Mrs. Brown greeted us in the living room with a smile like sunshine in springtime. With a few words to the effect that I would return in time to change the water for them, I left, feeling highly elated over the impression my machine had made on the family. I had my doubts about that Eliza, though. She had kept up a grumbling about "new fangled contraipshuns bein' worthless" that I was a bit nervous how much she might influence Mrs. Brown.

However, I'll tell you next all about what happened when I went back to give lesson number two in washing with washing machines.

See Page 86

How do you handle complaints?

Do you know just what is meant by: "The customer is always right"?

***The Master Salesman* applies that maxim to an actual complaint at the request of one of our readers**

The Master Salesman's Analysis

That idea of getting back with the machine the night before "washday" was truly a master stroke. As the finishing touch to creating an enthusiastic interest, the Master Plumber worked up to a climax as skillfully as a moving picture producer. Climaxes are as essential in the game of selling as in making a play interesting. There is another factor that was considered; the Browns are the thrifty type that do not believe in debt, and putting the machine in their home where they would see it in actual use was the most powerful lever Jones could have found to pry them away from their set principle of "paying cash." When they failed to "jump at" his offer of easy terms he realized they were not easily influenced and it meant arousing more than just ordinary interest to make them buy. That is why we analyze his work as a climax when he walked out of their house that evening with his machine standing in their laundry.

Getting there early gained a point. Brown was so much interested in the whole affair that he was downstairs waiting for Jones. Evidently intent on seeing and hearing everything. Was that just curiosity? In part, possibly, yes, but, in the main, doesn't it look as though it might be genuine interest? He was even the one who admitted Jones. And he was so afraid of himself, his interest, almost desire, to buy the machine that the first few words he spoke evinced a very weak effort to convince Jones of his decision "not to buy now." Like most prospective buyers who are half sold on an idea, he wanted Jones to know he "wouldn't buy now," but couldn't conceal his desire to see and know more about the machine. He weakened further when he undertook to explain that he "could raise the money easy enough." What did that convey? Wasn't it an unconscious inference of half a favorable decision?

We think one of the best points in Jones' salesmanship is being a good listener. You will notice he has not interrupted his prospective customers once, when they were expressing negative thoughts that must have been tantalizing in the extreme. He keeps an eye on Mrs. Brown, too. It isn't necessary for her to say anything. Watch her expression closely enough when she listens to what Brown has to say and her thoughts are easily comprehended. Again Jones impresses them with the fact that he cannot compel them to buy if they don't care to; but emphasizes his point that he just wants them to see an actually practical demonstration. That is salesmanship. We'll say it is, a hundred per cent—making a customer do the deciding and decide to buy is true selling.

Playing a side card to draw trump is an old rule of the game. Jones knew Brown had taken a two hundred and fifty dollar absolute gamble in an unlisted stock in an untried company. He knew he had borrowed from the bank to pay for it. He brought those facts to light in a casual way, but there was a deadly purpose behind his question and subsequent remarks. He wanted to impress Brown with his knowledge of a posi-

(*Continued on Page* 168)

Modern Drainage Fittings

Article No. 3

By R. M. STARBUCK, JR.

ONE does not realize, until he has given it some study, what an extensive subject we have undertaken when we try to give even a fleeting glance at the innumerable variations in modern drainage fittings.

In general, combination drainage and vent fittings have accomplished wonders for the plumbing system. They have been instrumental in providing fixtures with inlets into the drainage system that are sanitary in the highest degree. They have helped to reduce stoppages to a minimum.

Intelligent Use of Fittings Reduces Installation Costs

We want to emphasize again the labor factor in connection with the use of these fittings. Twelve dollars a day for an eight-hour day means that when a journeyman plumber has used up ten minutes of time, either usefully or wastefully, he has cost his employer twenty five cents, and it is just the easiest thing in the world to throw that amount of time away, and much more, in fiddling around, in puzzling over some difficult connection, even before an attempt has actually been begun on the work itself. Right here the special combination fitting steps in, and its intelligent use must often result in a very great reduction of such labor cost as this.

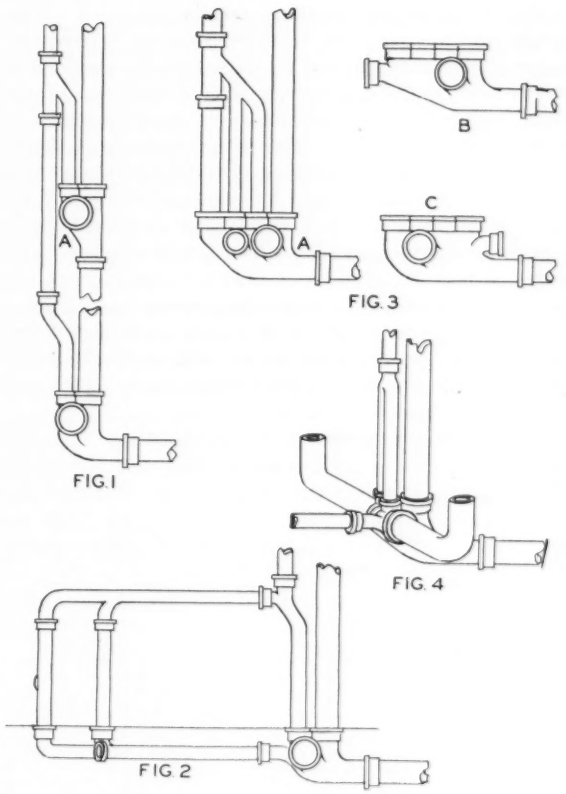
Times have changed—it doesn't pay to tinker any longer. It often actually costs less today to replace with new material, rather than to run up a labor cost in the repairing of old material. And, the only thing for the employer to do is to be awake and alert to all these things, and to keep in step with the constant change that is taking place in the practice of plumbing and in the general conduct of business.

In the two preceding articles our attention has been given principally to drainage fittings made for use on a straight run of stack. While these are in the great majority, there is need also for combination fittings designed for use on the soil stack where it offsets, and it is this type of fitting that we shall consider in the early part of this article.

Hoover Report on Drainage and Vent Fittings

The Hoover report gives quite a bit of attention to the design of the plumbing system at the point where a stack enters the house drain, that is, where the vertical connects into the horizontal. The same considerations, of course, apply to the offsetting of stacks, for even if the offset is only a short one the conditions and results are quite similar to those met with in connecting into the house drain. We quote from the Hoover report, page 51, as follows:

"Another critical point in the design is the turn where the vertical stack enters the horizontal house drain. In systems where the stack and house drain have the same diameter, no special provision need be made, beyond providing a turn of sufficient radius to make an easy bend. In systems where the house drain is one or more sizes larger than the stack, the bend should have a diameter at least one size larger than that of the stack."



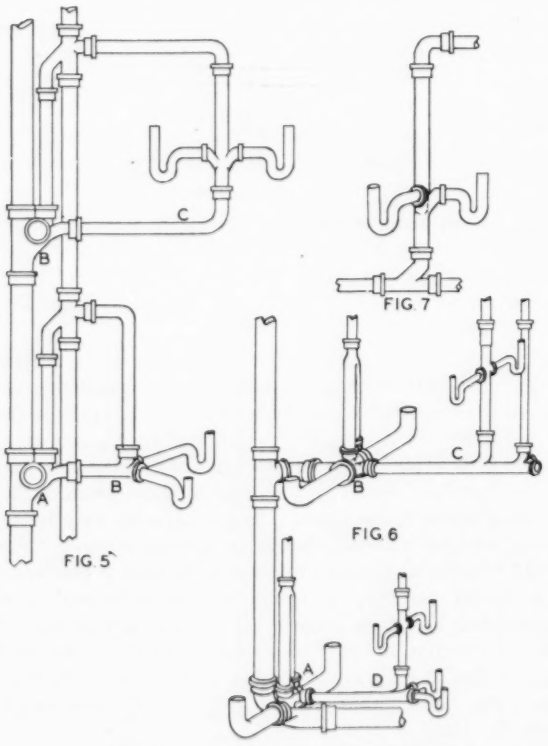
Again, on page 103, under the heading, "Base Fittings," appear these further remarks:

"The remaining point for consideration in connection with capacities—namely, the bend or turn connecting between the stack and house drain or a lateral branch to the house drain—is not readily determined by experimentation. It is evident that insufficient capacity in this part would produce effects very similar to those produced by an insufficient house drain. Ample capacity may be secured without material change in present methods. For small systems no special provision as to sizes is necessary. For larger systems, in which the probable peak load approaches the stack capacity, it is necessary to specify the construction in order to insure a capacity in the stack base fitting at least equal to that of the stack. In such cases the house drain will be one or more sizes larger than the stack.

"A requirement that the increase be made at the union of the stack and base fitting rather than at the union of the base fitting and house drain would solve the problem. In case the house drain is two sizes larger than the stack, the base fitting might be the intermedi-

ate size. For example, in a system that requires a 3-inch stack and a 4-inch house drain, the base fitting should also be 4 inches, or in a system which requires a 3-inch stack and a 5-inch house drain, the base fitting should be at least 4 inches in diameter. The specification might be simplified by the requirement that in all cases for soil stacks the base fitting between the stack and house drain should be one size larger than the stack. This would work no particular hardship when the requirement is not actually needed, and would reduce the possibilities of detrimental back pressures around the base of the stack, which may occur under certain conditions, even in very small installations. The same requirement should be observed whether the turn is made by means of a long-sweep one-fourth bend by means of the two Y fittings or by means of a Y fitting and one-eighth bend. In this connection, the long-sweep one-fourth bend with reducing hub will give the desired connections with one less fitting than if an ordinary long-sweep bend is used. We have used this bend with 3-inch stack and 4-inch house drain, in test installations, with decidedly better results than were obtained with 3-inch stack, 3-inch base fitting and 4-inch house drain."

On page 223 of the Hoover report the matter of weight of cast iron pipe is given consideration, and in view of the fact that in this article most of our attention has been given to fittings made of cast iron, we think the discussion in question will not be out of place. Therefore we quote as follows:



Need for Research in Weights

"The committee is of the opinion that extra heavy pipe is unnecessarily heavy, but that standard pipe is too light for the great majority of plumbing uses. The tonnage of iron which is used in soil pipe is great enough to warrant a thorough scientific study of the whole subject in the interest of the best engineering practice and the conservation of natural resources. The committee favors the idea that the manufacturers of soil pipe, in co-operation with the American Society for Testing Materials, should investigate the question of reducing the wall thickness of cast iron soil pipe to some thickness between one-eighth and one-fourth inch, and if such reduction is found desirable and practicable, to standardize the same and allow cast iron pipe of the new dimensions to take the place of the extra heavy and standard pipe now in common use.

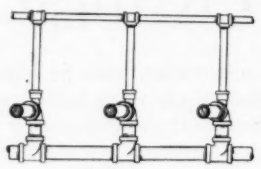


FIG. 8

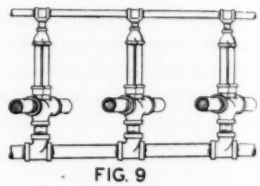


FIG. 9

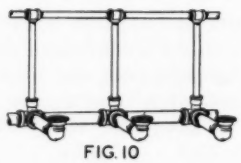


FIG. 10

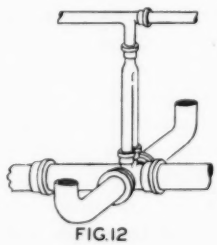


FIG. 12

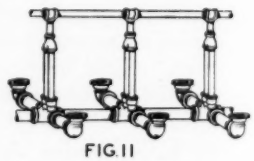


FIG. 11

"The committee also favors a careful study involving the manufacture of cast iron soil pipe in lengths exceeding 5 ft.

"A thickness of 3/16-inch for straight pipe has been suggested, but the committee is of the opinion that the actual dimensions of both pipe and fittings should be based on tests of strength and quality of metal and other involved factors, and should not be the result of compromise or off-hand opinion.

"The committee recommends also that manufacturers of cast iron pipe continue to develop and market small sizes of pipe, namely, 1½ and 1¼ inches in diameter."

As already intimated, in the preceding articles of this series we have shown many types of so-called crowfoot drainage fittings, for use on straight runs of stack. The same design in many instances is applied to the same conditions of fixture installation at a point where the stack offsets. Our meaning is best shown by reference to Fig. 1. Here it will be seen the lower offset fitting is of the

same design as the upper fitting, made to serve the same combination of fixtures.

Large Number of Fitting Combinations Available

There are several manufacturers who have specialized in such fittings as these, and their catalogs show an almost endless line of them, covering every imaginable combination.

This offset drainage fitting is known by different

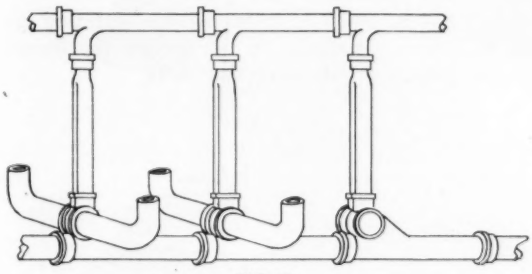


FIG. 13.

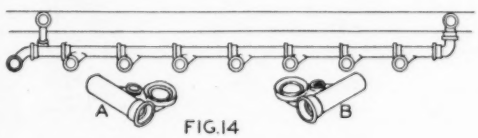


FIG. 14

names, the two most commonly used being sanitary sweep tee and offset sweep closet tee. Practically all of these fittings are designed with as long a sweep as practicable, and it is this that gives them the name.

In Fig. 2 the sweep tee is the same as in Fig. 1, but with a side inlet. This same fitting for use on a straight run of stack is seen in Fig. 5, at A and B.

The three fittings shown in Fig. 3 illustrate still more complicated installations, also the fitting in Fig. 4, and fitting A in Fig. 6.

Fig. 3 will serve fairly well to show how these fittings are put together to cover different construction, A, B, and C each providing for the water closet and one other inlet, the latter being located differently in each case.

With these fittings have been designed an equally ex-

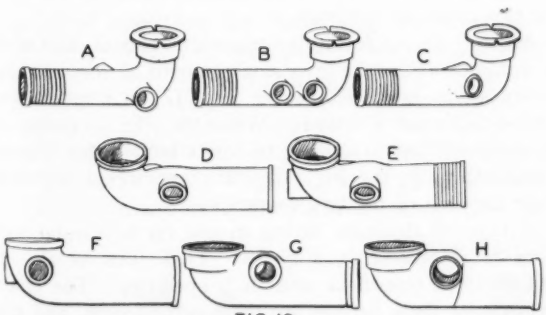


FIG. 19

tensive line of vent fittings, some of which we show in Figs. 1 to 6, but which we shall give special attention to in another article.

Fig. 6 shows an interesting development in the upper combination fitting B. This is called a vented sanitary cross, and is made in several different combinations and lengths. As will appear from the illustration, this fitting is used when the two water closets back up to each other at a greater distance from the stack than the regular stack fitting can serve.

Possibly these offset drainage fittings show even more clearly than the sanitary tees what they can accomplish in a limited space. If one will just figure out in his mind what it would mean to accomplish with common fittings the work that any one of the fittings in Figs. 3 and 4 accomplishes he will gain some idea of the advantages and economies that lie in the use of these modern combination drainage and vent fittings.

We believe that the first special fittings to be designed were such fittings as A in Fig. 1, followed later by similar fittings covering a greater number of inlets. The great utility of these fittings soon suggested further development of fittings to augment the work of these principal fittings, and we see some of these designs in Figs. 2, 5, 6 and 7.

In Fig. 2, for instance, we see where two drainage fittings and two vent fittings do the entire work for a bathroom in which all three fixtures are to be vented.

In Fig. 6 the fitting C shows a design similar to that in Fig. 2, but serving a different fixture layout. The fitting D serves the same layout but in different location relative to the stack. Here, by the way, the two fixtures

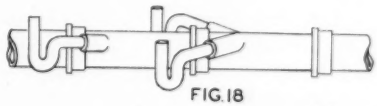


FIG. 18

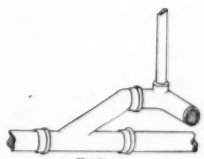


FIG. 15

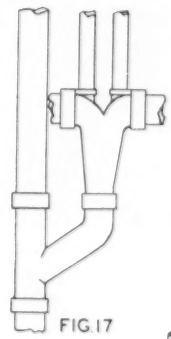


FIG. 17

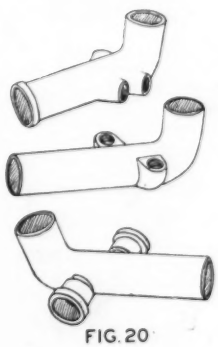


FIG. 20

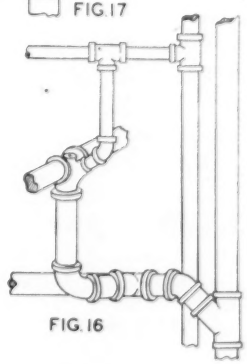


FIG. 16

whose outlets are below floor, are wet vented through the connection for the elevated fixtures.

In Fig. 5, B is a similar fitting, known as a combination double Y pattern waste and C a combination waste sweep, into which a combination waste and vent cross discharges.

Fig. 7 shows a similar fitting, but with the waste open-

ings at right angles to each other rather than opposite. This is called a combination side outlet waste and vent tee.

Figs. 1 to 7 give only just a fleeting glance at the big array of such fittings that are now available for use.

Next we come to another extensive line of drainage fittings and combination drainage and vent fittings used especially for water closets on horizontal soil lines.

Some of these fittings we show in Figs. 8 to 16.

Circuit and Loop Venting Fittings

Circuit and loop venting have come very largely into use in recent years, especially in the case of batteries and double batteries of water closets. The development of drainage fittings for such batteries, however, has been more along the line of practice calling for individual water closet vents rather than for lines of fixtures served by circuit or loop vent.

In the illustrations alluded to, Figs. 8 to 16, only one, Fig. 14, shows special fittings for circuit-vented lines.

The fittings illustrated in Figs. 8, 9, 10 and 11 are for screwed soil pipe. Figs. 8 and 9 are for single battery and double battery work, and Figs. 10 and 11 are for single and double battery, respectively, also.

Figs. 12 and 13 show fittings of similar character to Figs. 10 and 11, but are for cast iron systems. It will be noted that these cast iron fittings are made of exactly such length that no piecing out between fixtures with short pieces of pipe is necessary. This of itself represents a considerable saving in labor.

This idea of designing the lengths of fittings to avoid the necessity of cutting short pieces is carried out extensively in the design of many of the modern drainage and vent fittings. It is seen, for instance, in the case of the long vent tees shown in Fig. 13. Many of such fittings are scored for several inches at the spigot end, so that the length may be varied without the amount of labor called for in the ordinary process of cutting.

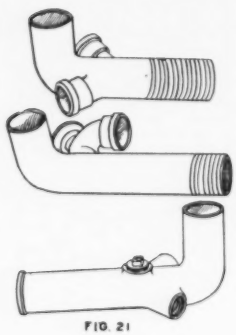


FIG. 21

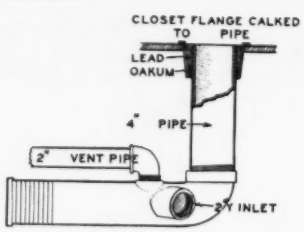


FIG. 24

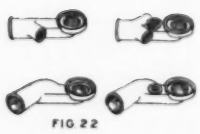


FIG. 22

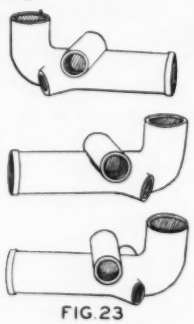


FIG. 23

In Fig. 14 special tees are shown for use on a circuit-vented line. There are many of these branches, designed for varying conditions. They are designed along correct lines, inasmuch as they allow the flush from each water closet in the battery to enter the main horizontal soil line from the side rather than from the top. As we have several times pointed out, when the water rushes into the horizontal line from the top it forms a curtain of water across the pipe, which interferes with the free passage of air through the pipe, necessary to correct venting. This objectionable feature is entirely overcome in the use of these special branch fittings.

A and B, Fig. 14, show the same type of fitting provided with a vent opening for use in case the fixtures are to be provided with individual vents.

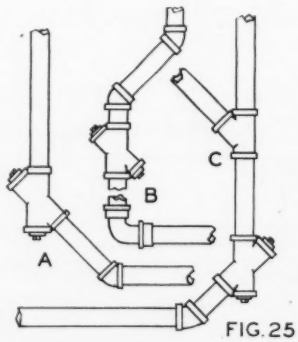


FIG. 25

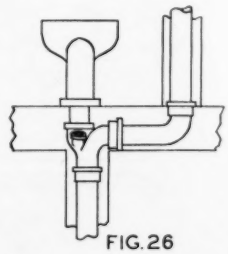


FIG. 26

In addition to the common type of water closet, there is also the wall-hung water closet to be considered. There are many different kinds of fittings used with these fixtures, three of which we show in Figs. 15, 16 and 17.

One reason we show no more of these fittings for wall-hung water closets is that many of them are so very special, and their use so dependent on a certain make of water closet, that they really do not have a place in an article like this, which deals more with the generalities of the subject.

The vented fitting of Fig. 15 may be obtained for single, double, horizontal or vertical installations, for cast iron or lead work.

The cast iron tapped cross seen in Fig. 16 is for screw pipe systems, and is very economical of space. It has provision for venting, also an accessible cleanout between the two principal openings.

Another fitting for wall-hung water closets, and also so designed as to take up a small amount of room in the utility space, is to be seen in Fig. 17, in combination with a universal Y branch. While the Fig. 16 fitting is so designed that a single pipe vents both water closets connected to it, the Fig. 17 fitting requires a separate vent for each of the two connections.

A type of drainage fitting in use on horizontal soil lines is illustrated in Fig. 18. These are of the Y branch type, tapped or with hub openings. The chief features of these fittings are their extra length, and the fact that the branch opens into the body of the fitting above the center, that is, above the level at which waste naturally flows.

Cast Iron Closet Bend

Now we come to still another class of drainage and combination drainage and vent fittings, known as the cast iron closet bend. It is certain that this fitting has

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had a great deal to do with the improvement that has come to the plumbing system in recent years.

The use of the lead bend was the orthodox method of connecting the water closet with the drainage system, and off this lead bend the vent was taken. Also, into the lead bend lead branches carried the waste of other nearby fixtures and sometimes fixtures not so nearby.

There are those even now who feel that this kind of work is the best.

It is surprising to see to what extent the design of the cast iron closet bend has gone. In Figs. 19, 20, 21, 22 and 23 we show some of the variations in these designs, and we do not mean to say that we here show anything like a complete listing of these fittings.

One of the big things about these bends is that they provide excellent entrance into the drainage system for other fixture wastes.

It is true, of course, that when one of these cast iron closet bends becomes clogged, all fixtures discharging into it are also put out of commission. This perhaps is the principal argument why it is better practice to discharge a fixture into a crowfoot fitting or into some other special drainage fitting than into a cast iron

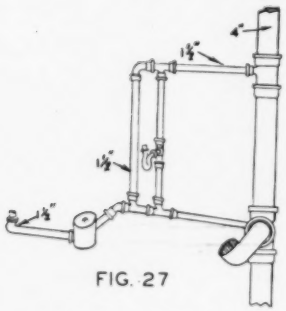

FIG. 27

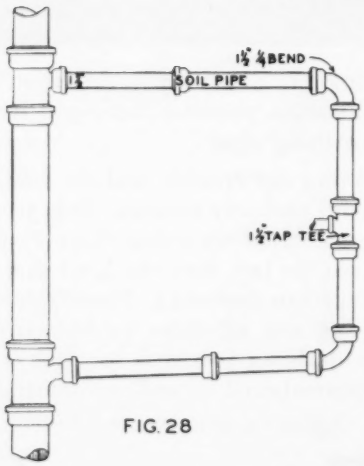

FIG. 28

closet bend. However, we want to point out the fact that these closet bends do not often give this sort of trouble.

In Fig. 19 three different types of bends are shown. A, B and C show different styles and combinations of inlets. G shows two inlets staggered, while H shows them opposite each other. E and F show heel inlets, which have never been considered good practice.

D and E are designed so that the side inlets open into an enlargement in the bend, which is claimed to overcome any siphonic tendency.

For G and H, whose side inlets are above the flow of water through the bend, the claim is also set up that this fact overcomes siphonic tendencies. Because of the position of the inlets, it is also claimed for these bends that they provide complete protection against leaks below the floor at waste connections.

Fig. 20 shows an assortment of bends, one of which has three inlets, another has two top inlets, and the third has two staggered hub inlets.

Many of these cast iron bends are made with their spigot end scored so that they may be easily shortened. The other end of the bend is also scored for the same purpose.

Fig. 21 shows still other variations. The lowest bend shows a vent opening on top, which may be plugged if no vent is to be used.

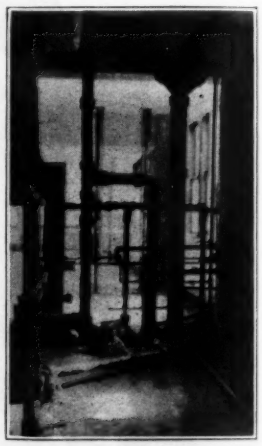

Fig. 29

Fig. 22 shows another type of closet bend. These bends are 4-inch up to the point where the branches enter. The top is there flattened to 3-inch, making it 3⅝ inches in area. This design is claimed to allow the top of the bend from this point to the stack to serve as a vent chamber. It may be stated that Fig. 22 shows only a few of the variations that this type of bend is supplied in.

The three bends seen in Fig. 23 present still another feature. The top openings are vent openings, and the lower ones are waste openings.

There are many different methods of connecting the closet bowl to the cast iron bend. One of these is shown in Fig. 24, in which the closet flange is caulked to a wrought iron nipple which screws into the shallow hub of the bend.

Two-Way Cleanout Fitting

While not exactly in line with the general character of the fixtures we have been considering in this article, we want to mention an excellent fitting which is illustrated in Fig. 25, and which is known as a two-way cleanout fitting.

In each of the three uses of this fitting shown in the illustration, it will be seen that the waste line may be easily cleaned from either direction, also by changing the plug from one opening to another, any opening may be used either as a waste or as a cleanout opening.

We believe this fitting is designed especially for sink wastes, but it is clear that it may be used wherever it may seem desirable.

Fig. 26 shows a very handy combination fitting which we omitted to mention in the preceding article.

A point which we should not omit in connection with these special fittings is that cast iron fittings and pipe

(Continued on Page 91)

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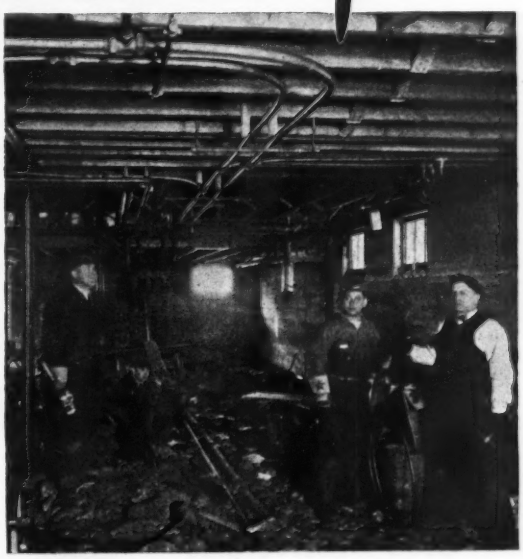

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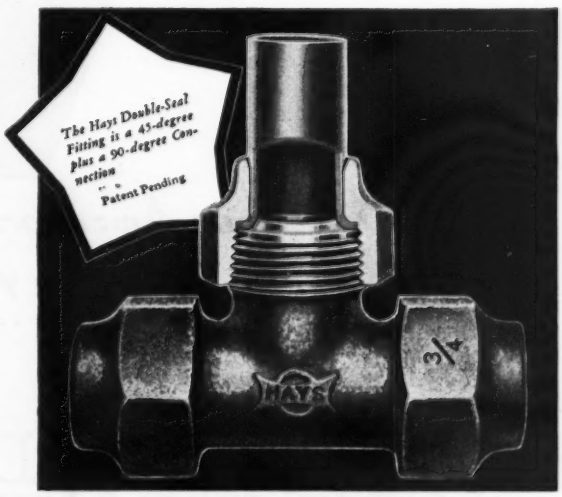

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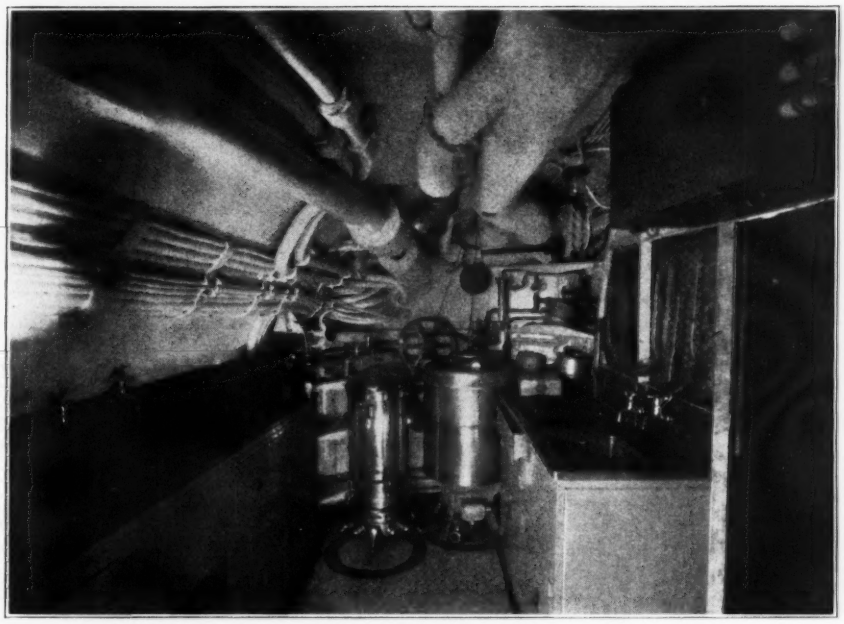


Galley of a cruiser submarine showing kettle, urn, sink and dresser

The V-5 —Plumbing in a Cruiser Submarine

By E. W. SYLVESTER

THE cruiser submarine V-5 now under construction at the Navy Yard, Portsmouth, New Hampshire, and to be commissioned this year is fitted with a plumbing system typical of the very complete plumbing systems installed in the larger modern submarines of our navy. The following general description of the plumbing in this latest unit of our undersea forces is subdivided for clearness in presentation into the following systems; viz., fresh water service, washroom and lavatory supply, hot water, and waste.

Fresh Water Service

The fresh water service system, see Fig. 1, supplies potable water from the potable water tanks to the scuttlebutts, the officers' pantry sink, the hot water tanks, the kettle, urn, sink and dresser in the galley, and to emergency fresh water outlets in all main watertight compartments of the vessel.

The ship is fitted with a distilling plant for the production of fresh water. Two types of evaporators are installed. One type utilizes the heat of the Diesel engine exhaust gases and may be used at all times when the engines are running. The other is heated by steam from an oil-fired boiler.

Fresh water is carried in the V-5 in three tanks which are built into the lower part of the structure of the vessel. These tanks are located in the lower part of the vessel in the interest of surface stability primarily, and, secondarily, because of structural convenience. Cement wash is applied to the interior surfaces of these tanks as a preservative coating. Potable water is carried in two of the tanks. The third is a boiler feed and auxiliary fresh water tank.

A filling and transfer line leading through the vessel connects the above tanks to each other and to the test tank of the distilling plant. Tanks may also be filled from another vessel or from a shore connection. No permanent outboard connection is provided for this pur-

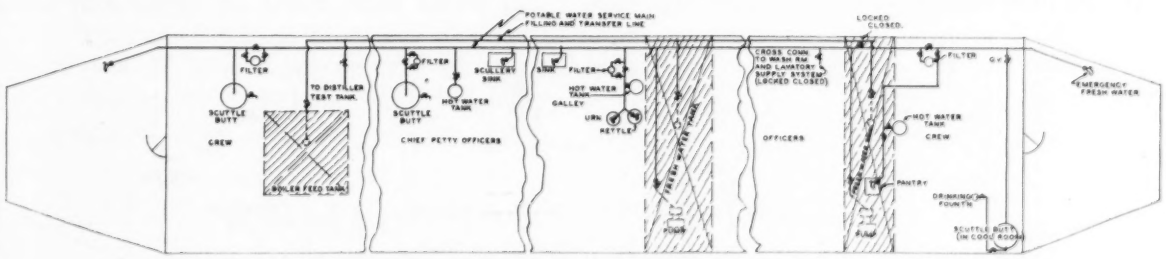
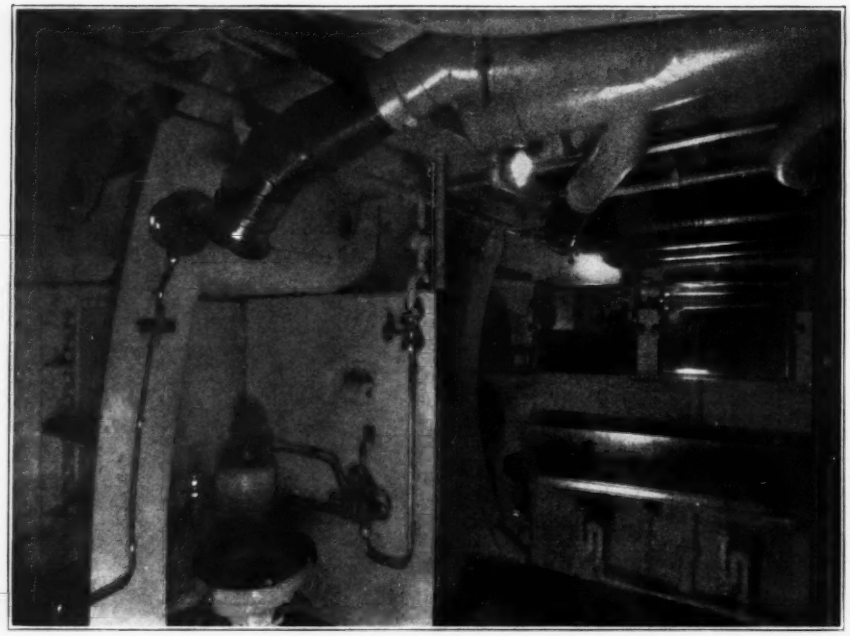


Fig. 1.—Submarine potable cold water supply system



Washroom of a cruiser submarine showing basins and air expulsion water closets

pose. Such filling is done through a portable hose to a hose valve provided in the filling and transfer line.

Water is supplied from the potable water tanks to the fresh water service main by means of double piston air-operated submerged pumps. These pumps are located in sumps in the tanks and they are operated by compressed air from the ship's service air system. They are capable of maintaining any predetermined pressure up to 100 pounds per square inch at the pump discharge. The pressure on the fresh water system may be regulated by adjustment of the reducing valve through which compressed air is supplied to the pumps. The pumps function automatically upon the opening of any fresh water outlet. This type of pump is particularly suited to use aboard submarines since it is fully automatic and requires no attention over long periods of time. It is sturdy and simple, and sturdiness and simplicity in submarine equipment is at a premium due to the difficulty of overhauling machinery in the crowded spaces of these vessels and the heavy upkeep work load required of submarine crews under the best conditions.

The fresh water service main runs from the forward compartment to the aftermost compartment. This main is a 1-inch galvanized wrought iron pipe. Branches from the main are, however, brass pipe.

In general, all fresh water outlets are of the self-closing type. The use of such outlets is, of course, desirable in any plumbing installation in the interest of economy, but, their employment is of particular importance aboard naval vessels which must be self-sustaining in fresh water to their full military radius of action.

The diving officer of a submarine must know at all times the amounts of consumable weights on board in order that he shall always have the necessary information to adjust his variable ballast and keep the vessel in diving trim ready to submerge. Distant reading gauges are fitted in fresh water tanks to expeditiously supply this information in the case of fresh water. The principle of operation of these gauges is the displacement of an entrapped fluid. A small metallic bellows in the tank is actuated by a float to which it is mechanically connected. Compression or extension of this bellows due to movement of the float results in extension or compression of a similar small bellows in an indicator, the two bellows being connected by a sealed copper tube completely filled with an air-free and non-freezing fluid. The bellows in the indicator is connected to and actuates a pointer over a dial calibrated for the particular tank to which the indicator bellows is concealed. The indicator may be placed in the vessel without regard to location of tank.

Practically every tank in a submarine is provided with air connections for blowing the contents of the tank overboard to lighten ship in an emergency. The fresh water tanks of the V-5 are fitted with such connections which may also be used for forcing water through the service line by air pressure in case the fresh water pumps should be inoperative.

All potable water outlets are protected by filters.

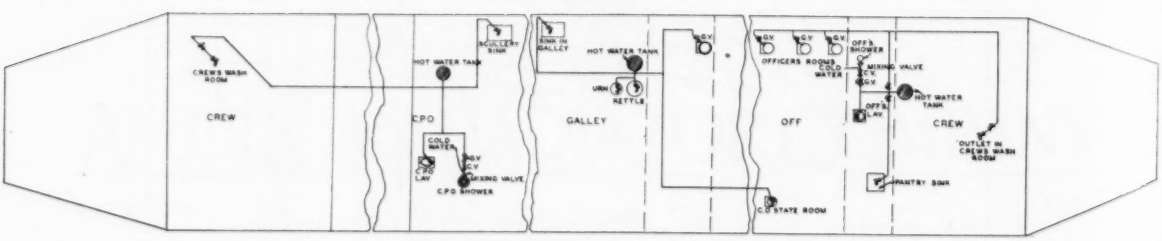
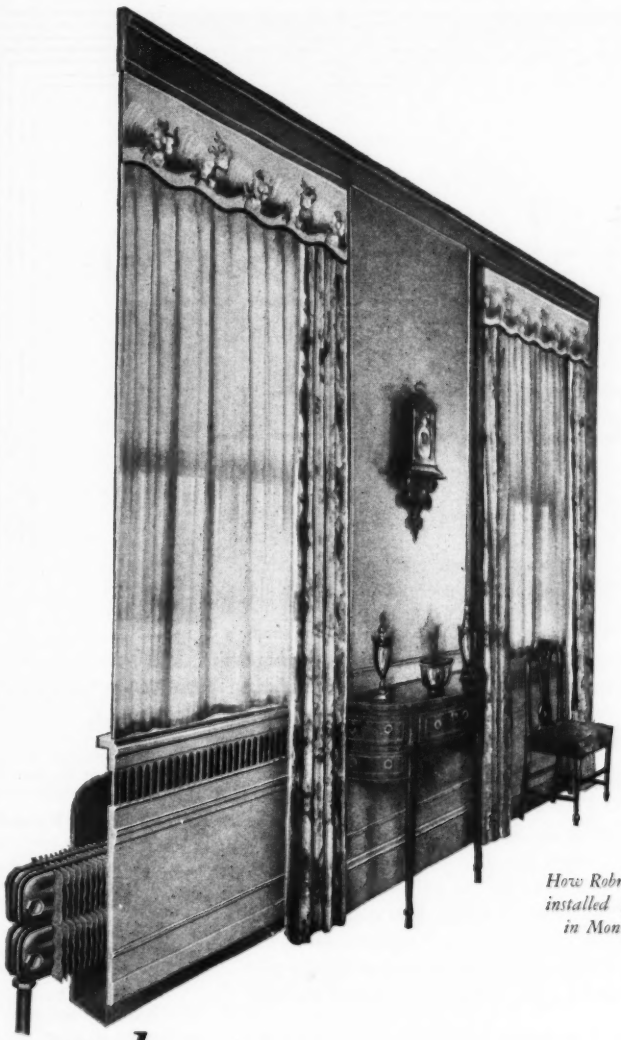


Fig. 2.—Submarine hot water system



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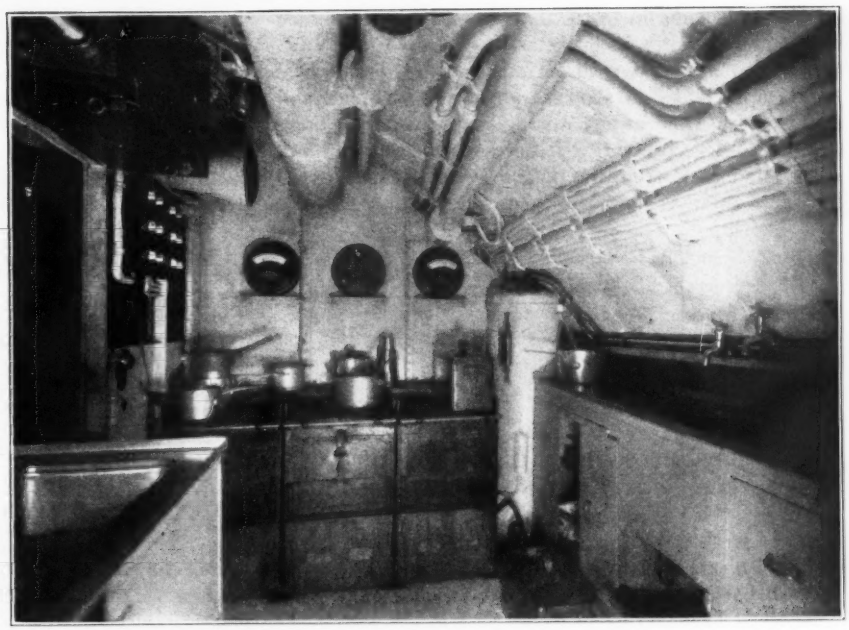

Galley of a cruiser submarine hot water tank, sink and ranges

Filter cases are brass, tin lined, and nickel plated on the outside and enclose a stone filtering cylinder. The cover is secured to the case by wing nuts to allow for easy removal of the filter cylinder for cleaning. Water enters around the outside of the cylinder. The filtered water outlet is in the center of the cover. Filters have a filtering capacity of one gallon in two minutes. They are required to stand a test pressure of one hundred pounds per square inch. Bypasses are fitted around these filters to permit removal of the filtering cylinder for cleaning.

The fresh water service system is cross connected to the wash room and lavatory supply system in order that in case of depletion of the potable water tanks, fresh water may be obtained at potable water outlets from the boiler feed and auxiliary fresh water tank. The stop valve in this cross connection is normally carried closed. The fresh water supply system is also cross connected to the fresh water filling and transfer line in order that water may be provided to potable water outlets from a shore connection when the vessel is tied up at a dock, the filling and transfer lines being hooked up to the shore connection by means of the portable hose connection referred to above. This cross connection is normally locked closed.

Three scuttlebutts are installed in the V-5; one forward in the crew's quarters, one amidships in the chief petty officers' quarters, and one aft in the crew's quarters. As the ship's refrigerating plant is located forward, the forward scuttlebutt is installed in the cool room and its discharge is piped to a drinking fountain in the forward crew's quarters. The other two scuttlebutts are located too far away from the refrigerating plant for brine piping to be run to them. They are therefore arranged to take bulk ice.

The V-5 like all submarines is divided into a number of watertight compartments by pressure proof bulkheads. In the event of an accident resulting in flooding of a compartment, the watertight doors in the bulkheads bounding that compartment may be closed and the flooding localized. Under such conditions it might very likely occur that men would be isolated in a compartment beyond the damaged compartment as they were in the S-4. It is therefore desirable that food and water be available to such men until the vessel can be raised by the crew or by outside assistance, as conditions may be such that this course of rescue would be preferable to immediate escape by the use of the recently developed submarine "Lung." In older submarines cans of fresh water are provided in end compartments for emergency use. In the V-5 and other later submarines, however, permanent outlets from the potable fresh water system are provided in each main compartment.

Washroom and Lavatory Supply

Water for washing purpose is obtained from the boiler feed and auxiliary fresh water tank. A 1-inch pipe runs the length of the ship for supplying water from this tank to the various washing outlets. A submerged air-operated pump, similar to those described under the fresh water service system, is installed in the feed tank and discharges into the above washroom and lavatory supply main.

In order that salt water may be made available at washing outlets in case of a shortage of fresh water, the wash room and lavatory supply main is fitted with a 1½-inch hose valve adjacent to a similar valve on a salt water line in the engine room. A portable section of hose is provided and stowed near these valves for connecting the salt water line to the washroom and lavatory supply main when required.

The V-5 is fitted with washrooms and showers for officers, chief petty officers, and crew. In addition, individual wash bowls are installed in officers' staterooms. Hot and cold water are provided to officers' and chief petty officers' washrooms and showers. Crew's showers and lavatories are piped for cold water only. However, a single hot water outlet is provided in each of the two

crew's washrooms in order that the crew may be able to obtain hot water in buckets.

Stop and check valves are installed in the hot and cold water supply lines to showers piped for both hot and cold water to prevent any mixing of the water in these two lines. This precaution is necessary because the hot water is supplied from the potable water tanks whereas the cold water is supplied from the boiler feed and

The hot water tanks are of copper heavily tinned. Five 1,000 watt immersion type heating units are installed in the bottom of each tank. The tanks are heavily insulated with layers of insulating material arranged in the following order; asbestos, hair felt, sheet rubber, hair felt, and another layer of sheet rubber. This insulation is covered with a galvanized sheet steel lagging. The tanks are fitted with automatic temperature control

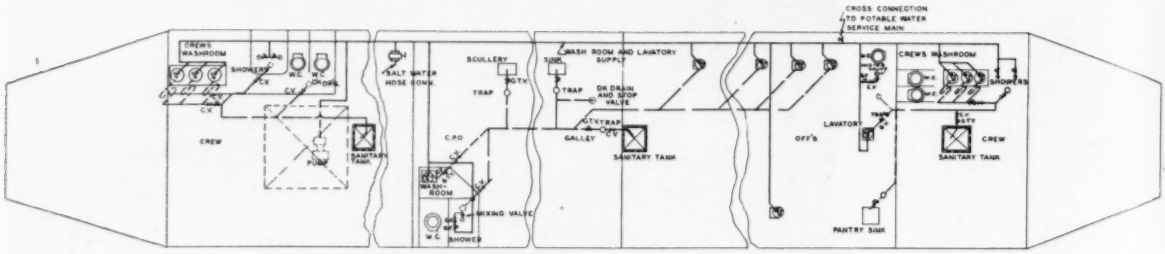

Fig. 3.—Submarine washroom and lavatory supply and waste system

auxiliary fresh water tank. Anti-scalding mixing valves are fitted on these showers.

Wash bowls in the crew's washrooms are of pressed metal about 11 inches by 14 inches by 5 inches with overlapped metal slab. This material is used in the interest of durability and lightness. These wash stands present a very finished appearance and are very much like the familiar washstands in Pullman cars. The use of pressed metal bowls welded to metal slabs has been so satisfactory in the past that this construction is standard in submarine new construction for crew's washrooms.

Lavatories installed in the commanding officers' stateroom and in officers' and chief petty officers' washrooms are of vitreous enamel. The use of this material is largely dictated by the desire to obtain a finished appearance in these locations.

Metal washbowls are installed in the individual staterooms of the officers' quarters. These bowls are mounted in metal rings hinged to the bulkhead and the bowls may be folded up out of the way when not in use. Both hot and cold water is piped to these washbowls.

All fresh water piping in exposed locations in washrooms is nickel plated as a matter of appearance.

Hot Water System

The hot water system is really three systems; forward, amidships, and after, with a separate electrically heated hot water tank for each system. The forward hot water system supplies the forward crew's washroom, the officers' washroom, and certain officers' staterooms. The amidships tank supplies the galley, the commanding officer's stateroom, and other officers' staterooms not supplied by the forward hot water tank. The after hot water tank supplies the chief petty officer's washroom, the after crew's quarters, and the scullery. Fixtures to which hot water is piped have been mentioned.

units to maintain a temperature of 180 degrees Fahrenheit in the tanks. The other fittings are a thermometer, a reflex water gauge, and a relief valve. The relief valve is adjustable from 15 to 30 pounds per sq. in. pressure.

Waste System

The waste from all plumbing fixtures except water closets is drained into sanitary tanks built into the structure of the vessel. These tanks are fitted with connections to the ship's drainage pumps. Air connections from the ship's service air system are also led to the tanks in order that their contents may be blown overboard in the event that the drainage pumps are inoperative.

Deck drains are installed in all shower spaces and in the decks of washrooms and the galley.

Check valves are installed in the several branches of the waste system to prevent a higher drain from discharging through one located at a lower level, to prevent cross connecting watertight compartments through the drain line and thereby the possibility of flooding an intact compartment from a damaged one through the drain line, and to permit building up an air pressure in the sanitary tanks when it is desired to empty these tanks by blowing their contents overboard. All check valves are of the swing gate type and are backed up by stop valves.

Air Expulsion Water Closets

The water closets provided on submarines are of the so-called underwater air expulsion type, see Fig. 4, and they can be operated at the maximum submergence depth of the vessel. In fact one of the trials required on the test submergence of the vessel is the operation of all water closets.

Indicative of the many complications that obtain in submarine operation is the procedure required to perform such a routine func-

(Continued on Page 172)

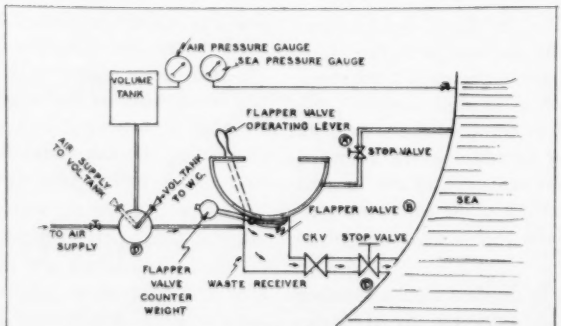

Fig. 4.—Under water air expulsion water closet

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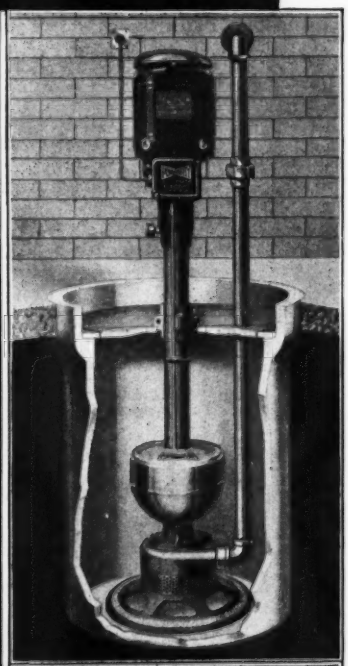
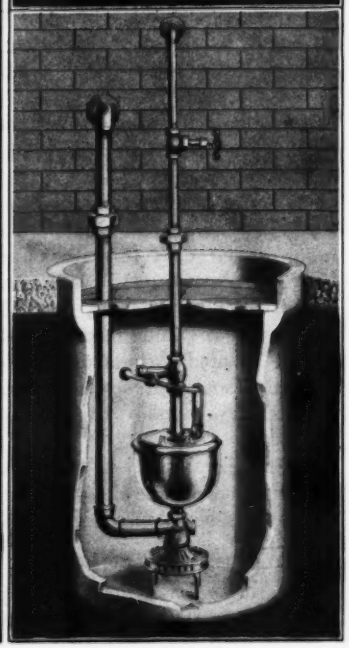


PENBERTHY AUTOMATIC ELECTRIC SUMP PUMP



PENBERTHY AUTOMATIC CELLAR DRAINER (Water Operated)

PENBERTHY PRODUCTS

THE plumbing contractor need not be told the many advantages of building from copper and bronze . . his never-ending work of servicing and replacing steel pipe, fittings and equipment are a constant reminder.

Penberthy Automatic Electric Sump Pumps and Automatic (water operated) Cellar Drainers are built of copper and bronze throughout . . they cannot rust.

The design and workmanship of Penberthy Pumps are as outstanding as the quality of the materials used in them. Consequently, these pumps are trouble-proof as well as rust-proof. Your profit from the sale and installation will not be dissipated in servicing.

There is a type and size of Penberthy Pump for every purpose. Sump covers for both electric and water operated units can now be supplied at slightly additional cost. Penberthy Pumps are stocked by leading jobbers everywhere.

PENBERTHY INJECTOR COMPANY

Established in 1886 — DETROIT — Canadian Plant Windsor, Ont.

PENBERTHY PUMPS REMOVE SEEPAGE WATER

The Three-Inch Stack *vs.* *the* Four-Inch Stack

By

S. M. BARR

WE NEVER have thought much of the man that easily gave up an old friend for a new one. If the old friend eventually was shown to be unworthy, that would be different, but in any event, we would have to be shown.

And that is about the way it is with the 4-inch stack. We have had "him" with us now, for many long years—in fact, "he" has been a life-long friend to each one of us, and we cannot afford to throw "him" over, except under the strongest provocation.

Until recent years, for the most part the country has not known of any other size than 4-inch for practically all soil stacks in all types of dwellings and many other installations. For a large part of the country, the use of 3-inch pipe for stacks serving water closets has been almost a horrifying thought. Here and there, however, cities can be pointed out which have consistently allowed the use of the 3-inch soil stack for years. In the city of Washington, D. C., for instance, according to the word of Mr. McGonegal, chief plumbing inspector, the 3-inch soil stack has been in use between 35 and 40 years, with most excellent results.

Today, however, we hear of many cities and towns and states which have revised their plumbing ordinances to allow the use of the 3-inch soil stack.

Hoover Code Recommendations

The impetus for this action, we believe, comes from the boost that the Hoover investigation of plumbing practices gave the 3-inch soil stack.

In referring to this subject, the following appears on page 58 of the Hoover report:

"An important conclusion reached by the committee after a thorough discussion of the experimental data was that a 3-inch soil stack has a greater capacity than has often been thought, provided that the house drain is of adequate size, that the points of inlet are well chosen, and the inlet fittings of proper type. While admitting that a larger size has a greater capacity, and may under some conditions be desirable, a 3-inch soil stack is deemed sufficient for any ordinary dwelling."

As we have many times pointed out, the conclusions reached by the Hoover sub-committee were made only after exhaustive tests conducted by the United States Bureau of Standards.

Inasmuch as we know of no higher authority than the Bureau of Standards, we have seen no other alternative than to accept as final the facts discovered and laid down by them, relative to the 3-inch stack.

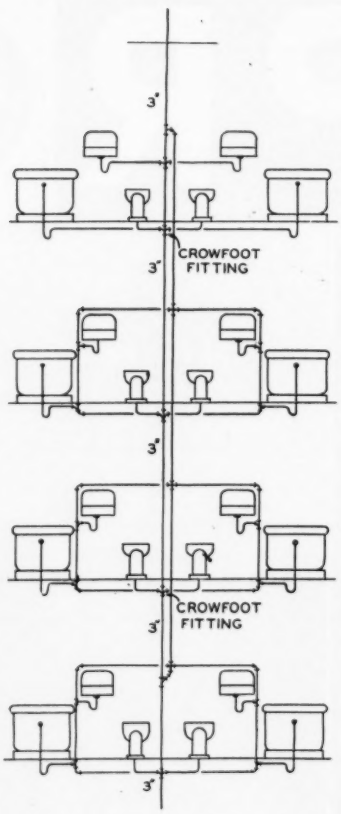


Fig. 1

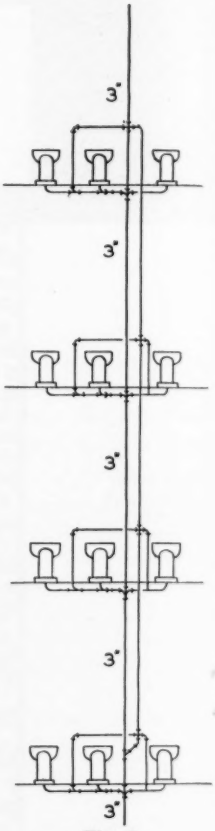


Fig. 2

If we had fears that the 3-inch stack might fail in properly handling even one or two water closets, we would do well to read what the Hoover report has to say on the subject of capacity of the 3-inch stack. There it was shown that a 3-inch stack flowing full, under ordinary house conditions, will carry water at the rate of 660 gals. per minute, an amount which is equivalent to the total discharge of 15 water closets. Of course it is inconceivable that if 15 water closets were installed in a single plumbing system, that all could be possibly discharged at the same instant. As a matter of fact, it has been estimated that a stack capable of carrying the above named amount of sewage, because of that fact could handle with a good margin of safety, an installation of 100 water closets.

An important fact in such calculations is the fact that never is more than a small fraction of the total number of fixtures being discharged exactly at the same instant.

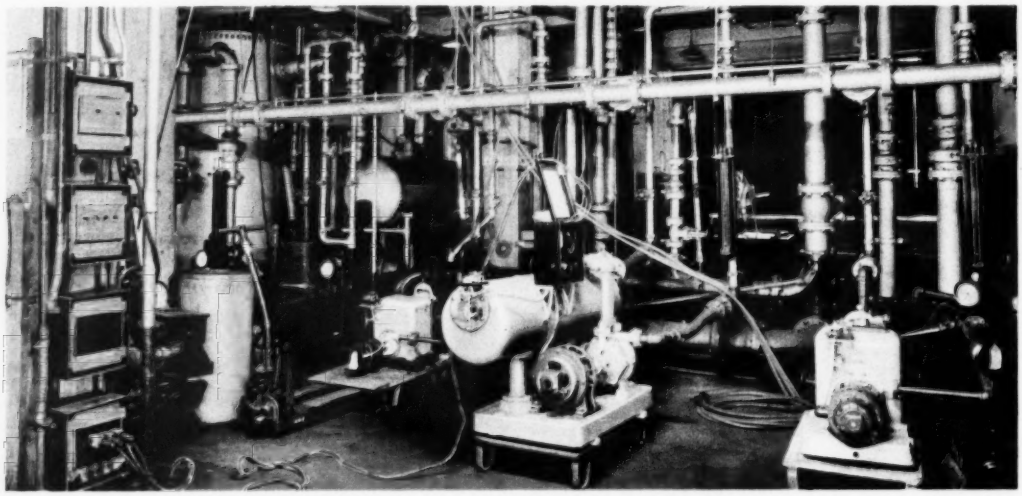
Illustration of Capacity of 3-inch Stack

In order to show graphically just what a 3-inch stack can be depended upon to do safely, we show in Fig. 1

Square foot ratings *often* "bite off more than the pump can chew"

To Determine a Heating Pump's Fitness for a specified radiation

tested air and water capacity is essential



General View of Laboratory in Nash Factory where Jennings Pumps are Tested

A vacuum heating pump removes condensation and air from the return line vacuum steam heating system. The quantities it is called upon to handle depend upon several factors. One is the amount of radiation in the system. Others are the degree of tightness of joints and fittings, the efficiency of traps, and the cooling effect of the return piping.

To rate a vacuum heating pump for a given number of square feet of direct radiation is acceptable only if the pump's capacity is sufficiently large to handle the returns from the radiation under the most unfavorable operating conditions likely to exist in practice.

Simultaneous water and air capacity of the pump and not its catalog square foot rating, is the dominant factor that determines the system the pump can serve satisfactorily.

Jennings Capacities are Determined by Tests

Jennings square foot ratings are supported by actual tested capacities. Every Jennings Pump is tested at the factory before shipment. The volume of water that the pump withdraws from the receiving tank under a prescribed vacuum and delivers against a specified head is accurately measured. At the same time the number of cu. ft. per min. of air that the pump removes from the receiving tank and discharges to the atmosphere is determined by the most reliable device available for the purpose... a calibrated test orifice. Horsepower required to deliver these quantities is found.

STANDARD TEST ORIFICE

Exclusive Jennings Design Assures Dependable, Economical Operation

Air and water are handled independently by the Jennings Vacuum Heating Pump. Air capacity is not affected by the volume of water being pumped. Water capacity remains constant when air is being handled.

A Jennings Pump will serve satisfactorily any reasonably well installed system of the size for which it is recommended, for the life of the building. Jennings capacities, as given in the table, are adequate under all conditions found in actual practice.

Condensate is handled only once. Less horsepower is required. Economical operation assured. These features are found only in the Jennings Pump.

Certified test reports, furnished to purchasers on request, guarantee Jennings capacities and horsepower, and afford the only reliable basis on which to compare vacuum heating pumps.

CERTIFIED REPORT OF TEST

CAPACITIES OF
JENNINGS VACUUM HEATING PUMPS

Pump Size	Equivalent Direct Radiation Square Feet	Water Capacity G.P.M.	Air Capacity Cu. Ft. Per Min.	Orifice Diameter Inches	MOTOR HORSEPOWER			
					10 Lbs.	20 Lbs.	30 Lbs.	40 Lbs.
T	2,500	4	3	7/64	1/3	1/2	1	1 1/2
U	5,000	9	3	7/64	1/3	1/2	1	1 1/2
V	10,000	14	6	9/64	1	1	1 1/2	2
B	16,000	22	9	5/16	1 1/2	2	3	5
C	26,000	35	15	1/4	2	3	5	5
D	40,000	60	19	9/32	3	5	5	7 1/2
E	65,000	90	34	1/2	5	5	7 1/2	10
F	100,000	140	50	7/16	7 1/2	10	15	15
*G	150,000	200	102	9/16 & 5/8	10	15	UPON REQUEST	
*H	300,000	400	171	2-7/16 & 1-9/16		UPON REQUEST		

* The last two sizes are out of the manifold type.

Jennings Pumps

NASH ENGINEERING CO.
SOUTH NORWALK, CONN., U. S. A.

an installation of eight bath rooms, and in Fig. 2 another installation of twelve water closets, each of the two plumbing systems being served by a 3-inch stack. These are in accord with the Hoover code.

What would the old-timer have said at such a monstrous proposition as eight complete bath rooms or twelve water closets being served by a single 3-inch stack? Of course the reason that he would have been appalled at such a suggestion is that he didn't know the truth about the situation. And none of us knew the real truth, although some might have suspected a part of it, until the Hoover commission scientifically proved it to us.

As we look at it, it isn't reasonable to sit back and say, "Well, even if the Hoover folks did prove it, I don't believe it, and I won't use the 3-inch stack on my work."

The Hoover report itself gives good reasons why we should make use of the 3-inch soil stack. On page 58 it says:

"The economies resulting from using a 3-inch instead of a 4-inch size are material. Less metal is required, transportation and construction costs are less. The 3-inch pipe can be placed in an ordinary wall without furring, thus saving cost and room space. A 3-inch soil pipe can be placed in a partition having 4-inch studding, and a 3-inch bend can be housed in the flooring better than a 4-inch bend. A 3-inch soil stack may be satisfactorily used for a high building, if the necessary conditions are complied with."

If we are satisfied that the government experts know their business, and are correct in their figures, then the foregoing advantages, it seems to us, should convert the most hard-boiled 4-inch stack man to the 3-inch stack.

We should explain on what basis we submit Figs. 1 and 2.

The answer to this is the table of sizes of soil and waste stacks found in Article X of the Hoover code. There it will be found that a 3-inch stack will efficiently handle up to 72 fixture units. Reduced to fixtures, this means eight bathrooms containing the three common fixtures, or twelve water closets.

Fixture Units

To those who may not understand what we mean by fixture units, it should be explained that with the discharge of the lavatory taken as a unit, the Hoover committee worked out the following comparative table:

	Fixture Unit		Fixture Unit
1 lavatory	1	1 urinal	3
1 kitchen sink	1½	1 shower bath	3
1 bathtub	2	1 floor drain	3
1 laundry tray	3	1 slop sink	4
1 combination fixture	3	1 water closet	6

We should speak of two qualifying facts concerning use of the 3-inch stack. One of these is this: "Not more than three water-closets or their equivalent in fixture units shall discharge into a 3-inch stack from one 3-inch branch, and not more than two such branches may connect to a 3-inch stack at the same point or level."

Another point is that in the case of the 3-inch stack, the horizontal line into which it discharges should not be less than 4 inches.

The table of sizes given in Article XI of the Hoover code shows that, depending on the grade at which the house drain is run, when serving up to 72 fixture units, the proper size may be 5 inches and even 6 inches.

Fixture Tabulation

Several years ago the writer made some tabulations for DOMESTIC ENGINEERING showing the number of so-called small fixtures and the number of water closets that would be allowed to discharge into stacks of the various sizes under the plumbing ordinances of various important cities. Without showing the entire tabulation, we think it will be interesting to show what the tabulation disclosed relative to the two sizes that we are discussing, the 3-inch and 4-inch sizes. This information is given as follows:

City or State	Small Fixtures, as Baths, Sinks, etc.		Water Closets	
	3-inch	4-inch	3-inch	4-inch
Atlantic City, N. J.	20	64		16
Chattanooga, Tenn.	36	72		8
Cleveland, Ohio	20	64	1	16
Detroit, Mich.	24	96		24
Great Falls, Mont.				12
Hagerstown, Md.	45	100		16
Jackson, Mich.	10	30		8
Columbus, Ohio	20	64	1	16
New Orleans, La.	36	72		10
Philadelphia, Pa.	16	25		12
Portland, Ore.	24	48		12
San Diego, Calif.	60	200		50
Galveston, Tex.	44			32
Port Arthur, Tex.	10	40		20
Hartford, Conn.	16	25		12
York, Pa.	44	96		16
Durham, N. C.				12
Rochester, N. Y.	50			30
Niagara Falls, N. Y.	30	64		16
Duluth, Minn.	50			20
Shreveport, La.				20
Minneapolis, Minn.	16			30
Buffalo, N. Y.	30	64		16
Keokuk, Iowa	20	64		16
Des Moines, Iowa	20	64		16
Bloomington, Ill.	8	64		16

A comparative study of the allowances made in the foregoing table, and those which the Hoover code allows, will be interesting, and no doubt bring out some surprising results.

In the first place, there is nothing consistent about the information the table affords. It is obviously guesswork.

A 3-inch pipe is the same thing in Bloomington, Ill., as in San Diego, Calif., but in the former only 8 small fixtures could discharge into a 3-inch stack, while 60 could discharge into the same stack in San Diego. Likewise in Philadelphia or Hartford, 25 small fixtures could enter a 4-inch stack, and in San Diego 200, or eight times as many.

We do not know what these cities would allow at the present time, but when the tabulation was made, in 1925, out of the entire list only Cleveland and Columbus allowed a water closet on a 3-inch stack, and at that only one was permitted.

The variation in number of water closets allowed on a 4-inch stack was 8 in Chattanooga and Jackson and 50 in San Diego.

Let us see what the extreme variations would be between the lowest allowances in the table and the Hoover code allowance.

On the small fixtures, Bloomington with 8 would

stand against the Hoover allowance of 72 lavatories, 48 sinks or 36 baths, on the 3-inch stack; also on the 4-inch stack, Philadelphia or Hartford, with 25 small fixtures, would stand against the Hoover code allowance of 300 lavatories, 200 sinks or 150 bathtubs, or a combination of them amounting to 300 fixture units.

When it comes to water closets, on which the comparison is more fair than with the small fixtures, we have 1 allowed on a 3-inch stack in Cleveland and Columbus, and none in other cities, against 12 under the Hoover code. The final comparison is 8 water closets on a 4-inch stack in Chattanooga and Jackson, and 50 in San Diego and under the Hoover code.

We realize that once a requirement gets into a plumbing code, it is not so easy to displace it with something else, no matter how superior the new regulation may be. We understand, therefore, how it is that general practice throughout the country is slow in accepting and enforcing the 3-inch stack requirement.

It may take some time, but we believe eventually the entire country will be on the 3-inch stack basis for all dwellings and for other small installations.

We haven't a doubt that there are many who are still honestly doubtful of the merits of the 3-inch stack, and it would be most interesting and valuable to learn from them what their arguments are.

Right Fittings Make for Efficient Maintenance

By W. H. WILSON

When a writer submits an article for publication in DOMESTIC ENGINEERING, he gives the reader the benefit of his experience and knowledge on the particular subject in question. Here and there are readers who are able to supplement the author's experiences and information with experiences of their own.

This discussion by Mr. Wilson was prompted by the article entitled "Steam Fittings and Accessories," by H. L. Alt, appearing in the February 22 issue, and is offered to our other readers as a supplement to Mr. Alt's article.

Send in your experience amplifying this or any other article appearing in DOMESTIC ENGINEERING. Experiences which bring out new ideas and information or show how to do a common thing in a new and better way will be paid for upon acceptance. Mr. Wilson says that he has a pad of paper and a pencil handy, when he receives the issue and reads it the first time, so that he can make notes of his experiences as they are suggested by the articles.

PIPEFITTERS engaged in maintenance work can provide convenient ways of handling their work, in some cases, by simple arrangement of some of the ordinary pipe fittings.

Many industrial plants have water, steam and other pipe lines that are not in service continually and may be shut off for weeks at a time.

When these pipe lines are not in daily use they are frequently shut off and drained. Shut off valves, at times, leak slightly and a drip near the valve, which may be a tee with a plug removed from the opening, not required for a pipe connection, or a coupling welded in the pipe near the shut off valve, can be used instead of the tee. Pipe lines in a horizontal position should have this tee with the side opening downward.

This arrangement will prevent leakage from the valve getting into the piping and equipment not in service which, in case of a water or steam line supplying fixtures in a building where the heating system is out of service, would be liable to cause damage in freezing weather.

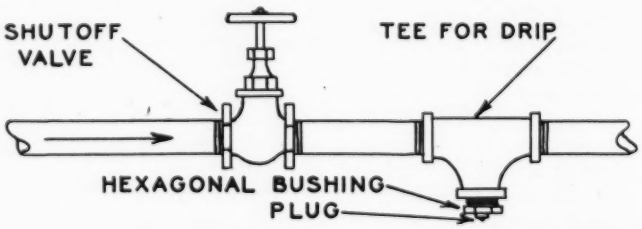
This opening can also be used for attaching a hose and blowing out the pipe line with compressed air, after it is shut off, relieving the piping of water and rendering it safe from freezing.

Use of Bushings

Bushings for pipe fittings can also be used to advantage as a plug, in some cases. For example, there are times when tees are put in pipe lines for cleanouts and future pipe connections, the opening in the fitting not immediately required is plugged.

The ordinary pipe plug has a small size square head, in proportion to the size of the tapped opening in the fitting and after the plug has been in use in the pipe line, especially steam lines, for any appreciable length of time, to remove the plug is difficult, without breaking off the head of the plug. Frequently it is necessary to chip out the plug with a hammer and chisel. By using a bushing of the full size hexagonal pattern, instead of the plug, it furnishes a better surface for the pipe wrench to get a good grip, in order to remove the same.

If a bushing is used, in this case, instead of a plug, it should be understood that a plug must be used in the smaller size opening of the bushing to complete the work.



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● Where permanency of installation is a factor of importance, as in drainage lines, vents and underground lines, Walworth C.N.I. pipe offers unique advantages. ● It has the long enduring life of cast iron, yet can be cut and threaded on the job and made up tight with the usual hand tools. ● And when it's in, it stays for years and years, leak proof and corrosion proof.

● Send for the C.N.I. Pipe Manual. ● It tells where we recommend the use of C.N.I. pipe — and, with equal frankness, where we do not recommend it.

Threaded for SCREWED COUPLING

GROOVED for VICTAULIC COUPLING

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Regularly made up in 5-foot lengths or in two or more welded lengths. Available in 1½"-2"-2½"-3"-4"-5" and 6" sizes.

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. . . Distributors in Principal Cities of the World . . .

I find it impossible to agree with you that

The Customer Is Always Right

Says a reader who submits a troublesome situation to the Master Salesman for solution—*and gets it!*

TAKING advantage of the standing offer of the Master Salesman to suggest solutions to sales problems, a reader of DOMESTIC ENGINEERING sent in the following letter, describing a situation which now and then arises, where a good and satisfactory job has not been paid for by reason of a complaint growing out of the work. Here is the letter:

The Letter

"I have been reading your articles on Plumbing and Heating Merchandising and have derived a great deal of good from same.

"However, I find it almost impossible to agree with you that the customer is always right. Would like to feel that way about it and settle our problems accordingly.

"I am going to cite you an example in my experience, then ask for your solution.

"I remodeled a bathroom, the room being very small. With careful planning I was able to install corner tub, pedestal lavatory and syphon-jet closet.

"The owner admits being well pleased with the job. Several of their friends have remarked about the appearance and convenience of same.

"As to the cost, there has been no serious objection except that it was a little more than they expected. We had to change all pipes under floor, lay linoleum, do plastering and carpenter work, also install storage water heater.

"During the installation a small leak developed one night and made spots on the ceiling in two rooms, about six inches in diameter. These soon dried but left a faint mark.

"They want me to repaper the two ceilings. I told them I would investigate the situation and then talk it over with them.

"I found out who did the papering and as the same party did work for me, I was able to get the desired information. He papered the two ceilings in question six years ago, using paper at 30c a double roll and he charged 30c per roll for hanging, a total cost of $24.00.

"I desire to maintain my customers and make satisfactory settlements with them. What would you suggest in this case?"

The Master Salesman Replies

YOUR letter has been handed to me and after thinking over your problem, let us see if we have constructed a true picture of your customer, yourself, and the situation:

In order to try and think with you, harmonize our thoughts, as it were, let us first explain what we mean by "the customer is always right."

The customer is always right figuratively. He is right from his own viewpoint, because he sees the picture from his side of the canvas, not yours. And likewise, that attitude is negative to yours, hence not right from where you see it. That all sounds very complex we know, but it is really simple when put in plain words—a difference of opinion. When two people of opposite viewpoints get to the point where one concedes to the other that he is right, there is no longer a complex of right or wrong—an agreement has developed.

A customer is always right figuratively, until you find the way to convince him you are right. You will notice we avoid saying—"until you convince him he is wrong." Remember, he only sees his side of the question so far, hence you must respect his opinion so far at least, that you know he thinks he is right and for you to think that way, you must exclude "wrong" from your own thoughts. The first point to reach for is, therefore: "How can I make him think I am right?"

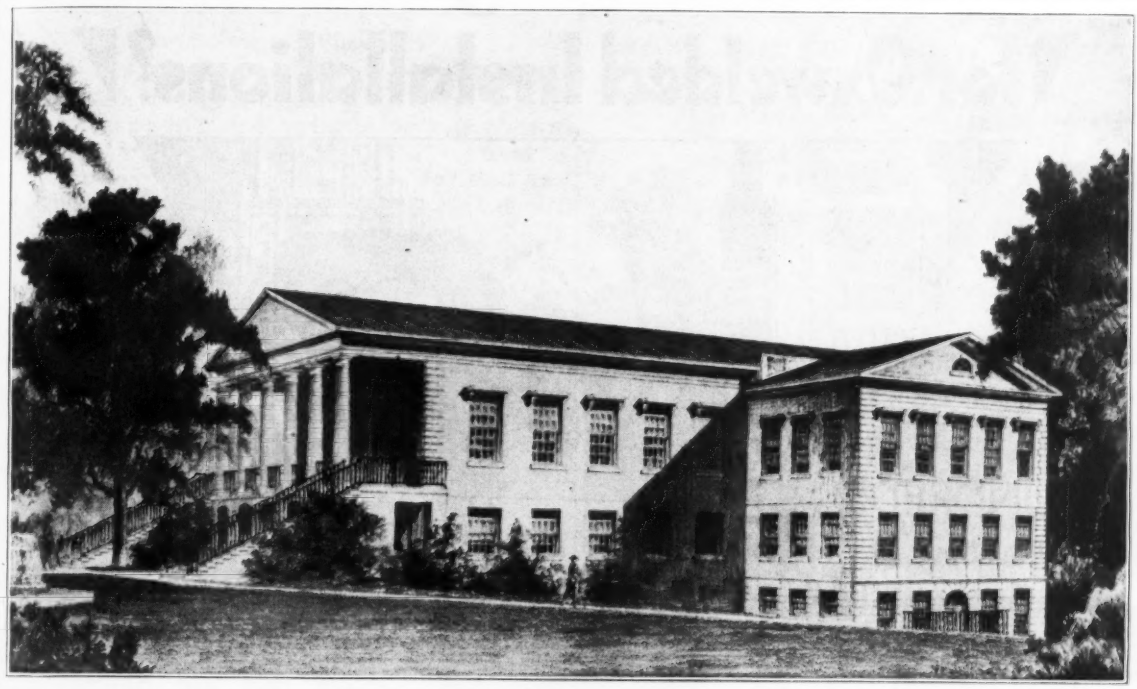
First, is it not true, that this customer came to you, selected you to do this work, because, out of many others, he had more faith in your ability than in your competitors? You may have been cheaper in price, maybe not, but certainly there was something else beside price—wasn't it confidence? Now if your customer had confidence in you, that means faith—trust. If he trusts you, would he wilfully try to take advantage of you in registering this claim? Assuredly not! He has only claimed this damage because he thinks you responsible. Doubtless, at the time he saw the stained ceiling paper, his mental decision was that you would make it right; probably surprised that you did not immediately agree with him. Naturally your failure nettled him. Wouldn't it nettle you? Hasn't his refusal to see it your way—nettled you?

Get over on the other side. Look at the situation as he sees it.

First of all he gave you the job because he trusted you; had faith in you.

You did a good job and he is well satisfied that

SIMPLEX FLUSH VALVES



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General Contractors: J. A. Jones Construction Co., Charlotte, N. C.
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Simplex Flush Valves are perfectly suited for such tasks. Due to the four way by-pass they can readily be adjusted to any pressure from the OUTSIDE so that they always meet varying conditions.

Ask your jobber to supply you.

Our Catalog

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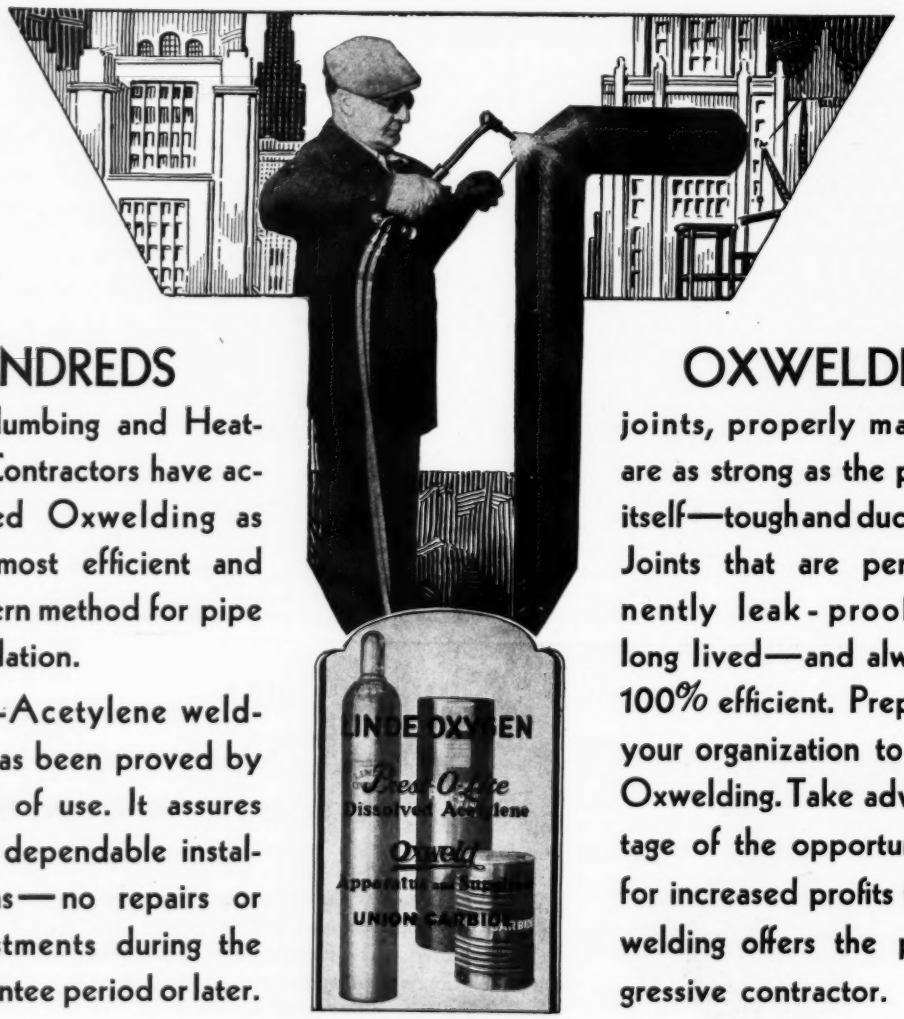

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Oxy-Acetylene welding has been proved by years of use. It assures tight, dependable installations—no repairs or adjustments during the guarantee period or later.

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Technical Publicity Dept. Gentlemen:
Yes—I would like to have your new booklet "Oxwelding Piping".
☐ For Industrial Installations. ☐ For Domestic and Industrial Heating Systems.

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Address .....
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in so far as the material and labor are concerned, he could have done no better had he selected anyone else.

Your work has won for you the commendation and praise of several of his friends.

The Customer's Viewpoint

There was no serious question over the cost except that it was a bit higher than he had expected, due to certain changes of piping, laying of linoleum, plastering, carpentering, and other details that are hard to pre-estimate. He saw all these things, doubtless you explained them to him, so that he is satisfied that he got full value for what you charged.

But—and here is the hitch, a couple of spots appeared on two ceilings, caused by a leak in a connection under the floor. Now just try to visualize his mental impression when he saw those spots on the ceiling. Wouldn't it make you mad? Here was a good plumbing job and all the good effect spoiled by a dog-gone leak in the pipe staining the ceiling.

You mention those ceilings having been papered six years ago. There is where you are going to get out from under your trouble if you don't get mad, but keep cool and convince him of some facts.

If you had been living in that house and saw the paper on those ceilings every day for six years, do you think you would notice the wear and tear of time, sun and light? Would you notice that the paper was faded, ready to come off, really in need of replacement?

Or, would it look to you like a perfectly good job, quite good enough to last another six years? And then one of a master plumber's careless workmen (his thoughts, mind you) causes a leak and necessity of a new job of papering. Where is it natural to put the responsibility? Why on the plumber who caused the leak; isn't it? Result, file complaint, which is not recognized—what then? Hold up payment of course.

You are both like an electric wire—united in opinion before this happened and all was serene. The spots on the ceiling broke the wire and when the two ends come close enough together, they fail to unite, but start sparks flying a-plenty.

This customer and his good will is worth preserving. What he will say to these friends who complimented your work, and what they will think of you, are worth just so much money in the bank to you, or like an investment in a poor stock, remain an eternal thorn in your side and an inestimable loss.

This is where "the customer is always right" comes in. You must patch this up so that he will retain his confidence and respect for you and yet not permit it to cost you too much money.

We hope you will agree with us that the leaking connection, in either old or new piping, should not have occurred and as the contractor you were at least morally obligated to insure him against any damage during the course of your alterations.

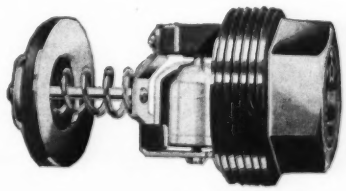
A Compromise

But he assuredly is not entitled to new paper at your full expense, where the paper on the ceiling has

"CONGRATULATIONS

on solving a problem which has caused us a great amount of trouble and loss of time"

THE above is from a letter from C. E. Ricker, heating contractor of Berwick, Maine. He goes on to say, "I have used a quantity of your No. 1 and No. 2 In-Airid Air Valves. I wish to take this opportunity to tell you that these valves have given most satisfactory results. I find that the radiators on which they are installed vent very quickly and completely."



IN-AIRID

The Invisible **AIR VALVE**

Heating contractors everywhere are enthusiastic about In-Airids because they not only insure complete venting but unlike any other air valve they do away with the air valves outside of the radiator, prevent tampering and add good looks and distinction to the installation. And every one of them carries our guarantee.

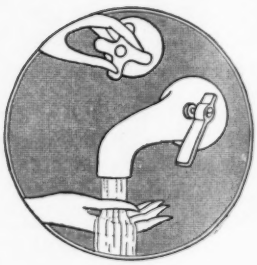
The famous time-tested Airid is still the largest selling external air valve in the world, low in price, high in performance.

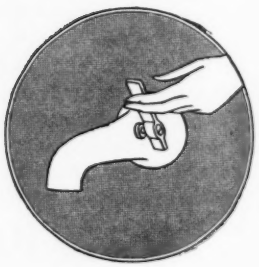
FOR STEAM	FOR VACUUM
No. 1 In-Airid	No. 2 In-Airid
No. 500 Airid	No. 510 Vac-Airid

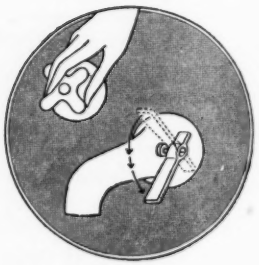
AMERICAN RADIATOR COMPANY

Makers of a complete line of GUARANTEED HEATING ACCESSORIES

SHOWER BATHING made safe . . . and simple . . .







By tempering the water at the spout first, accidental scalding is prevented.

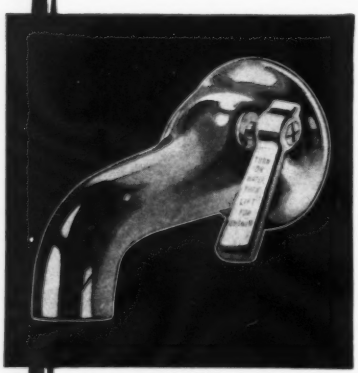
By merely lifting the lever on the spout, the same water is instantly diverted to the shower.

By shutting off the HOT and COLD valves, the diverter automatically returns to the tub position, which prevents unexpected showers.

Nothing in a combination bath fixture could be safer or simpler!

Why not install a tub fixture with all these advantages:

No Rubber No Spring



Gravity holds the diverter in the TUB position because the handle outweighs the flapper. When the water is on and the handle is raised, water pressure holds it in the SHOWER position as long as there is water in the riser.

Improved shower head with removable face plate and holes that will not stop up.

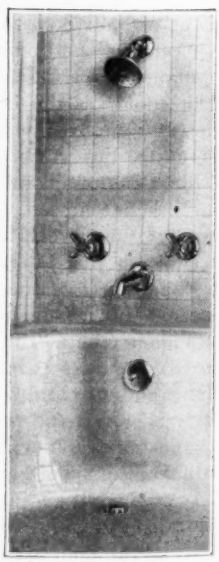
Only two valves, separate HOT and COLD in the wall which are accessible from the face of the wall.

Each Valve with a standardized unit that's as easily renewed as a light bulb . . . all wearing parts come out with the loosening of the cap . . . seat is of Monel Metal.

Diverter in spout on face of wall, not in wall. All metal . . . no rubber, no spring.

Pop-up bath waste with the stopper in the outlet of the tub—no need to get at it from behind.

Available in three distinctive styles: Art Chrome all-metal octagon pattern, chromium plated; round pattern with all-metal or china trim.



Write for a copy of our new 76-page catalog just off the press.

THE CHICAGO FAUCET COMPANY
2700-22 N. Crawford Ave. :: Chicago, Illinois

CHICAGO FAUCETS

already seen six years of service. If you explain to him that you concede his claim so far as the leak is concerned—"it should not have happened";—but in return, (we know he will be fair) he will agree that paper six years old is not worth the price of an entirely new ceiling, then you will reach a point where your minds will be in common of thought—sell him, with sincerity, your desire to be fair and meet him with equity. You will bear half the expense of one ceiling: Or, you will have both ceilings cleaned, paying ten dollars of the cost and he pay the balance. But you recommend that he consider how long the paper has been on, how much it is faded and stained. Isn't the paper, regardless of the stain, a detriment to what is otherwise a wonderful bathroom? His friends would wonder, when he spent money to create such a beautiful room, why he didn't repaper rooms anyway so that everything would look nice, new and fresh.

You have a job of selling on your hands, not an argument. Put the negative, combative thoughts out of mind and treat with him on repapering the same as you would if you were selling him a fixture. Don't fight or argue, or even reason. Get the picture of this as a job of selling an idea and shortly his viewpoint will change. With a slight compromise in money, he will accept your settlement because you will have won him over to your way of thinking.

So after all, it is always making the customer think you believe he is right because you need his good will, but convincing him that here and there, you are right. When you get his rights and yours on the respective sides of the scales, if you are a good patient salesman, yours will weigh heaviest.

We thank you for this opportunity to analyze a problem and trust you will be as much benefited as we have been by the good we find in the knowledge you have contributed to our own store of it.

Modern Drainage Fittings

(Continued from Page 70)

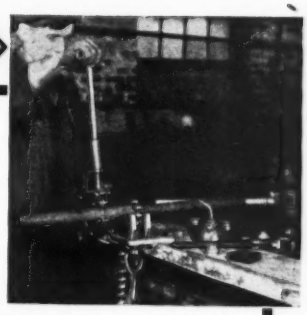
in the 1½-inch size are available, and this fact is important.

The designing and manufacture of 1½-inch cast iron fittings and pipe makes it possible to install work which is cast iron throughout. Such work is shown in Figs. 27 and 28. Fig. 27 shows a typical bungalow installation, while Fig. 28 shows a concrete job, with the 1½-inch pipe and waste fitting satisfactorily installed in a 4-inch partition.

By way of showing variations in our modern practice, Fig. 29 will be of interest. This shows the roughing for one of the toilet rooms in a twelve-story building in Minneapolis. In this city and in many others, steel stacks are generally installed in buildings of this size, but here the stacks are cast iron, while the branch waste and vent lines are of galvanized iron with cast iron fittings.

◆

The faculty of discrimination is one of the most clearly marked lines of differentiation between man and the brute.



This is the pipe vise to take to the job.

The ARMSTRONG BROS. Chain Pipe Vise is light and compact—goes into the tool bag easily. Attaches anywhere to any bench, post or corner. Combines maximum strength and capacity with minimum weight. It's ideal for outside jobs.

One piece jaw, which gives full support to even the smallest pipe.

Six improved features:

1. One-piece drop forged jaws (illustrated below).
2. Drop forged Base.
3. Drop forged Handle.
4. Alloy steel Screw.
5. Proof-tested Chain.
6. Hardened steel Nut.

Each ARMSTRONG BROS. Better Pipe Tool is an improved tool. Insist on seeing them before buying. You can tell them by the Arm-and-Hammer Trade Mark. Catalog P-10 which shows and describes these *better* pipe tools will be sent upon request. Write for it today.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
323 N. Francisco Ave. CHICAGO, U. S. A.

ARMSTRONG BROS.
CHICAGO

The HAAS Frost-Proof CLOSET

With Porcelain Enameled Flushing Rim Hopper

A Haas automatic frost-proof closet with cast iron hopper porcelain enameled inside, and with *porcelain enameled* Flushing Rim. Has the original Haas patented automatic frost proof seat action valve and stem with drain tube, and with combination check and inlet valve.

Like all Haas Frost Proofs, it prevents backwash of sewage into fresh water lines. Same high quality as always furnished in all Haas equipment. Other models have not been discontinued . . . the valve has not been changed . . . the Haas guarantee is ample assurance of value!

An Important Addition to the Haas Line

This Haas Frost Proof Closet with Porcelain Enameled Flushing Rim hopper, with valve of brass and springs of phosphor bronze, with only two washers, and with unusually simple construction is a unit you cannot afford to be without. Reasonably priced—easily sold.

Ask Your Jobber

THE PHILIP HAAS CO., Inc.
Dayton, Ohio

RETAIL ADVERTISING SERVICE

These pages this week carry two single column newspaper ads, one two-column newspaper ad, the usual sales letter and two publicity items. Also included is the eleventh of the "window-grams" with instructions for its use. The cuts for the single-column ads cost 35c each or $4.20 for twelve weeks' service.

Avoid High Blood Pressure

AN extra bathroom in the home saves that rush and hurry in the morning when the household prepares to begin a new day. Father gets delayed and has to run to catch his car or perhaps John Jr. is late for school —in any case, even the small-sized family can do with another bathroom. And when guests arrive there is no embarrassment over inadequate bath and toilet facilities. This extra convenience can be had by utilizing the space wasted at the end of a hall, in an alcove or unused closet.

(In this space your Name, Telephone Number and Address)

NEWSPAPER AD No. 69

WHAT AMERICA NEEDS MOST

"What America needs more than a good five cent cigar," remarked Harry Brown, local plumbing and heating contractor, "is more homes with extra bathrooms.

"It would save thousands of tempers all over the country. The head of the household gets up a little late and some other member of the family has cornered the bathroom. Father must rush through his shave and his soft-boiled egg and then do a Charley Paddock to catch a street car in order to get to the office before the noon whistle blows at least. You can imagine what a pleasant mood that puts him in for the rest of the day."

SALES LETTER

No. 31

HARRY BROWN

PLUMBING & HEATING

Two Rivers, N. Y.,
March 8, 1930

Mr. Edward Jones,
Two Rivers, N. Y.
Dear Sir:

If I were recommending household needs to the family of four or five members, I would place the need for an extra bathroom high on that list. Many people look upon the idea of an extra bath as a luxury, but it isn't; it is a practical need.

In one instance alone the extra bath more than pays for itself in the course of a few months. It saves wear and tear on the temper. The member of the family who reaches the bathroom first in the morning monopolizes it indefinitely, while the rest of the family chew their finger nails and wonder how late to work they'll be this morning. It's a bad way to begin the day.

An unused closet, an alcove or the end of a hall can be converted into an extra bathroom at no great expense.

Very truly yours,
HARRY BROWN

HERE are two newspaper publicity items —clip them and hand them to your local paper. They represent valuable sales help.

Why Have Smudge On Your Walls?

THAT dark smudge on the walls above your radiators doesn't add to the appearance of your home. No doubt its ugliness has often bothered you, but it returns as fast as you can clean it off. However, the remedy for the situation is within the reach of every household. By covering the radiators with cabinets or shields you can protect your walls, drapes and pictures, while at the same time you are transforming a none-too-beautiful heating unit into an attractive piece of furniture.

(In this space your Name, Telephone Number and Address)

NEWSPAPER AD No. 70

THE HAND ON THE WALL

"Did you ever casually put your hand on the wall while hanging a picture above a radiator?" asked Harry Brown, local plumbing and heating contractor.

"Then, when you stepped back to view your picture-hanging handiwork, you probably got quite a shock when you saw the white place left where your hand had rubbed off the smudge which accumulates so quickly above an uncovered radiator. Walls and drapes stay clean three times longer when radiators are covered with cabinets or shields, and at the same time you are enhancing the beauty of your home."

Practical Advertising Helps

Change Your Radiators Into Decorations

You need not let an unattractive radiator spoil the beauty and harmony of your home. Modern radiator cabinets and shields are made in attractive designs and finished in color effects to match your furniture, thus becoming an aid to the decorative scheme of your home. In addition, covered radiators prevent the accumulation of that dark smudge on the walls and in the drapes.

Not only is the covered radiator a decorative piece of furniture but a health protector, equipped with a concealed water reservoir, which humidifies and purifies the dry air.

(In this space your Name, Telephone Number and Address)

NEWSPAPER AD No. 71

For those of our subscribers who want to use two-column or larger ads, either of the illustration cuts on the opposite page may be used, according to the lay-out at left.

ADVERTISING should be considered as a campaign —each piece of copy ought to fit into a progressive campaign. These pages, for instance, will help build brief efforts proper to the season just opening. Each piece of copy ought to be strengthened by others—as the sales letter helps the newspaper ad, and the publicity items help both.

How to handle the window display shown at right

A Window Display Suggestion—No. 11

Take several dozen basin and bath stoppers and arrange them in the shape of a diamond of whatever size the extra space in your window permits, and then encircle the diamond with a ring, or two rings, of additional stoppers. Place the show card nearby.

The copy for the card can be set up by your local printer, or you can have your local sign writer or show card writer letter it by hand for you. Whichever course you follow, be sure that your card is of first-class appearance. Don't try to do the thing cheaply. Pay a dollar or two so that your card will be as good looking as any in any other store window on the street.

A Reminder

To take home that basin or bathtub stopper that you've been trying to remember

INSPECTION & M.I.F FITTINGS

It is not the number of inspections which counts but the standard set for acceptable fittings. M.I.F. Standard is without question the highest in every important detail. Appearance, threads, chamfer, alignment, soundness, are the most important factors. All of these are controlled and only fittings which passed within close limits are accepted with an M.I.F. Inspection OK.

By close cooperation with the Inspection Department, the Production Department, has been able to work out controlling methods for reducing the chances of defective work to a minimum. The processes developed by sixty-five years of progress are an additional safeguard for 100% quality product. Although the limits allowed are close, the number of rejects is extremely small. By such methods, savings are made which help to offset additional expense incurred in giving highest quality fittings.

MALLEABLE IRON FITTINGS CO.

BRANFORD :: CONN.

MECHANICAL O.K. INSPECTION O.K. MIF FINISH O.K. STANDARD

Accurate Estimating Determines Success in Oil Burner Selling*

By F. W. MARTIN

HOW many times have you had a prospective purchaser of oil burning equipment tell you that while he liked the burner that you tried to sell him he had signed up for a competitive burner, which in his opinion was just as good as the one you were selling and that he had bought it for less money? Then, did you ever take out your pencil and re-figure that particular job and say, "Now, I could have sold that job for $25 or $50 less than the other 'guy' and still make money." Has it ever happened to you? You know it has. Perhaps you said, "I couldn't expect to get them all and I didn't lose anything on that job anyway." The first part is true but how about the time, energy, gas, etc., that you used on that prospect? Or perhaps it was your salesman who used them. If so, how about him? In addition to the above he lost a commission and if he loses many that way he will lose his "pep" and you perhaps will lose a good man. Why not face this competition thing and cash in on it? You know that in any worth-while business there always is keen competition and the only solution for those who wish to exist is to meet it.

How? By using the methods that the successful oil burner dealer uses.

There are oil burner dealers who can not hold salesmen longer than about one month and the wails of each one of these dealers are about the cheaper burners that are in the market and the price cutting of competitors.

How much difference is there in the price of any oil burner for, let us say, "a certain job"? And, is the price of the burner the main factor that enters into the selling price of the installation? You know it is not, and you also know that the main factors are the cost of installing the oil burner, how much you think you should add for overhead and profit, and, of course, the percentage of your overhead, profit, and salesmen's commission is governed by the cost of the installation.

How do you arrive at the cost of installation?

Some dealers quote prices something like this:—

Tank Size	275	550	1080	1500	2000 etc.
Price Using Burner Size "A".....	$900	$1,000	$1,100	$1,250	$1,400

Some dealers total the price of the burner and oil storage tank and arrive at the price of the installation by multiplying by three.

If you are doing the same as these dealers, you are not meeting competition.

There are no two installations exactly alike. Therefore, each job that you figure on should be and is a new engineering problem. When you have realized this you will have arrived in the class of successful oil burner dealers, who are making many installations and naturally showing profits at the end of each year, for you will have learned to meet competition.

Important Requisites to Meet Competition

The main requisites to meet competition are common sense, a determination to be "the" oil burner man in your community, an honest desire to make more money on accumulative oil burner sales, a fair amount of business sense, sharp pencils, some paper and a six-foot rule or longer. The most important requisites are the rule, pencils and paper.

If you will measure the number of feet of suction line, return line, fill vent, vent line and gauge line, etc., and the price of each per foot, and then figure the number of cubic yards of excavating and make a thorough and complete survey of the needs of each particular job, you will be more than surprised at the difference in the cost of each installation, even though you use the same size and type oil burner and the same size tank on each job.

I am taking it for granted that every dealer keeps an up-to-date price list of tanks, piping, fittings and all other material needed to make a complete oil burner installation. You, no doubt, know how many cubic yards of dirt a man and helper can dig in an hour, also how many feet of each size pipe and fittings can be connected in an hour, and how many bricks can be laid in an hour and how many hours it will take a man and helper to do a certain amount of fireproofing, and how many hours it will take to do the amount of electrical work required for an average job, etc., etc.

The following is a list of material used on an average installation. I would suggest that dealers who are not handling prices systematically should get a card file and list these items, with prices, such as pipe, fittings, electrical material, etc., and it will serve as a ready reference for them. I would also suggest that the dealer does not use this average list of material to fit each job but that he try to figure the actual material used for each new job as closely as possible. The proof that it can be done lies in the fact that I am doing it and so are a good many oil burner dealers and those that I know who are doing it are all in the successful class.

Material for Average Job on Suction Line

½" Pipe
1—½" St. Ell
1—½" x ⅜" Red. Ell
1—½" 45° Ell
8—½" Ells
1—½" Foot Valve
1—½" Globe Valve
1—½" Ball Check Valve
2—½" Unions
1—½" x ⅜" Red. Coupling
1—2" x ½" x ½" Double Tapped Bushing
1—3½" x 1 Bushing
1—½" x 2" Nipple
1—½" x 3" Nipple
1—½" x 4" Nipple

Vent Line

1¼" Pipe
4—1¼" Ells
1—1¼" 45° Ell
1—1¼" St. Ell
1—1¼" x 2" Nipple
1—1¼" x 3" Nipple
1—1¼" x 6" Nipple
8—1¼" Pipe Straps
1—Vent Cap

Return Line

½" Pipe
1—½" Ell
1—½" x ⅜" Red. Ell
8—½" Ells
1—½" Check Valve (Used only for high tank)
1—½" Union
1—½" x ⅜" Red. Coupling
1—½" x 1" Bushing
1—½" x 2" Nipple
1—½" x 3" Nipple
1—½" x 4" Nipple

*Excerpts from "The Flame."

Fill Line

2" Pipe
1—2" St. Ell
6—2" Ells
1—2" Tee
3—2" x 6" Nipples
3—2" x 8" Nipples
1—2" Fill Box
1—2" Plug

Gauge Line

2" Pipe
1—2" Fill Box

Boiler Controls

1—1¼" x ¾" Bushing
1— ¼" x ¾" Bushing

Electrical Material

50 ft. 3-strand Wire No. 18
50 ft. Rubber-covered Wire
30 ft. ½" Black Conduit
50 ft. "Bx" Conduit No. 14
2—3" Round Junction Boxes
1—Square Junction Box
1—Square Pull Switch
3—½" Connectors
3—½" Angle Connectors
3—½" Conduit Bushings
3—½" Conduit Lock Nuts
1—½" Porcelain Caplet
1—Roll Friction Tape
1—Roll Rubber Tape
½ Box Plain Staples
¼ lb. "BX" Staples

Other Items to Be Added

Oil Burner, Excavating, Back-Filling, Removal of Dirt, One Quart Fire Extinguisher, Plans, Permits, Etc., One Year's Service, Charge and Incidentals, Overhead and Prifit, Salesman's Commission.

Cement Work

Breaking and Replacing

Combustion Chamber

Cement, Fire Brick

Fireproofing

20 Plaster Boards
150 lbs. Gauge Iron 24" x 96"

Tank Gauge Labor

Cost of Labor to Install all of the above material

As an example of installation costs for two different jobs in the same city using the same type of burner and both jobs having the same size oil storage tank, installed using the same type of labor, the accompanying surveys and estimates are recorded.

You will notice that the difference in price for these two jobs was $277.80. Had the dealer quoted $1,102.70 for job No. 2 he would have lost money and had he quoted $1,380.50 for job No. 1 he would have been too high and a competitor, who figured more accurately, would have gotten the contract. These are just two examples as to why it is advisable to figure your actual installation costs as nearly correct as possible. If I had the space I could show dozens of jobs where the actual cost varied from $25.00 to about $1,000.00 using the same burner and the same size tank. In fact I have two jobs on my desk right now which call for the same size tank and same burner and the prices quoted are $830.00 and $920.00.

Job No. 1 Survey

Tank (outside) 1000 gallon
Burner
From tank to burner...25 ft.
From tank to curb.....30 ft.
From tank to building.10 ft.
Cellar floor to sidewalk..
level ..... 9 ft.

Job No. 1 Costs

1000 gal. tank in hole.....	$ 100.00
Excavation, Backfill, etc..	160.00
Pipe, fittings and labor...	90.00
Burner.....	235.00
Electrical matl. and labor.	35.00
150 Brick, etc., and labor..	25.00
1 qt. Fire Extinguisher...	9.00
1 yr. service and incidentals	50.00
Permits, etc.....	90.00
Total Net Cost.....	$ 794.00
Overhead and Profit 25%.	198.50
	$ 992.50
Commission on Selling Price, 10%.....	110.20
Selling Price.....	$1,102.70

Job No. 2 Survey

Tank (outside) 1000 gallon
Burner
From tank to burner...60 ft.
From tank to curb.....50 ft.
From tank to building.25 ft.
Cellar floor to sidewalk
level .....14 ft.

Job No. 2 Costs

1000 gal. tank in hole.....	$ 100.00
Excavation, Backfill, etc..	240.00
Pipe, fittings and labor...	185.00
Burner.....	235.00
Electrical matl. and labor.	35.00
300 brick, etc., and labor..	50.00
1 qt. Fire Extinguisher...	9.00
1 yr. service and incidentals	50.00
Permits, etc.....	90.00
Total Net Cost.....	$ 994.00
Overhead and Profit 25%.	248.50
	$1,242.50
Commission on Selling Price, 10%.....	138.00
Selling Price.....	$1,380.50

Difference.....$ 277.80

I know that it is almost impossible to figure every nipple and every fitting and each foot of wire, etc., but you can figure out the footage close enough to give you a very close line on your costs.

The oil burner market is big and growing bigger each year.

If you check up on the more successful dealers you will find that they work systematically and use up-to-the-minute methods in figuring their installation costs and are satisfied with a fair profit in order to meet competition.

Kennedy Bronze Fittings

made of the same high grade metal as used in Kennedy Bronze Valves. Every fitting individually tested by air pressure under water.

THE KENNEDY VALVE MFG. CO. ELMIRA, N.Y.

New York Philadelphia Cleveland Atlanta Chicago El Paso Salt Lake City Los Angeles San Francisco Seattle

KENNEDY

VALVES-PIPE FITTINGS-FIRE HYDRANTS

PROFITS FOR PLUMBERS...

Monel Metal sink installed in the residence of F. O. Young, by the MONARCH COMPANY, *Denver, Colo.*

Tell your customers about Monel Metal sinks for Modern Homes!

It's easy to make your customers see the many advantages of a Monel Metal sink...to make them realize that there's nothing like silvery Monel Metal for kitchens that must always look cheerful, clean, modern.

Tell your customers that Monel Metal offers a more remarkable combination of properties than can be found in any other available material. You can explain that Monel Metal is easily kept clean...that it resists corrosion... that its sterling beauty lasts a lifetime... that its beautiful lustre harmonizes with any color scheme...that it has no coating to chip, crack or wear off.

You'll be suprised how many prospective customers for Monel Metal sinks there are in your community. Let us send you helpful information about Monel Metal and the program of national advertising that is making it easier for you to sell Monel Metal installations.

Monel Metal is a technically controlled Nickel-copper alloy of high Nickel content. It is mined, smelted, refined, rolled and marketed solely by The International Nickel Company. The name "Monel Metal" is a registered trade mark.

INCO MONEL METAL TRADE MARK

MONEL METAL

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

Much Engineering Information Acquired at 1930 Annual Meeting of A. S. H. V. E.

(Continued from Page 84, February 22 Issue)

Pressure Difference Across Windows in Relation to Wind Velocity

It is common knowledge that the amount of air passing through a window as leakage is dependent upon the pressure difference across the window and the crack opening. At the present time there is a considerable mass of data from laboratory research showing what the leakage is for various kinds of windows for any specified pressure difference but there is little definitely known about what the pressure difference actually is or is likely to be in any given building. In the absence of knowledge regarding this quantity, it is usual to assume a certain wind velocity appropriate to a given locality and take the leakage as that corresponding thereto, which is equivalent to assuming a certain pressure difference at the window. In continuing this study and in presenting their paper entitled "Pressure Difference Across Windows in Relation to Wind Velocity" the authors, J. E. Emswiler of Ann Arbor and W. C. Randall of Detroit had in mind the need for more definite information on the subject of pressure difference across windows. The definite objectives were to attempt to show how the chosen value of wind velocity for tables given in the Guide of the A. S. H. V. E. should be rationally determined for a particular case, to ascertain if the factor of 80 per cent of Part II is a reasonable value; and if possible, to see what is the effect of temperature difference.

A record of pressure difference across two windows, one on the second floor and one on the fourth, on the west end of one of the buildings of the University of Michigan, was obtained continuously over a period of 45 days, extending from the middle of January to the first of March, 1929. The highest momentary pressure difference recorded was 0.88 in. of water, which, in terms of wind velocity, would be about 42 miles per hour. It was pointed out it is probable that there should be a greater differential than 15 per cent in the allowances for infiltration and transmission loss between the windward sides of a building and the sides of lesser exposure.

In the matter of distribution of leakage at windows at different levels and increased amount of radiation necessary, it was found that the leakage at the second floor for a double hung weather-stripped wood window is about 17.5 cu. ft. per hour per foot of sash crack, and that at the fourth floor about 12.8 cu. ft. which calls for 0.025 sq. ft. more radiation per foot of crack on the second floor than on the fourth. With eight windows of say 50 ft. of sash crack each, including transoms, the total difference in radiation would amount to 10.0 sq. ft. Considering windows of poorer construction, and taking frame leakage into account, the total difference in radiation between the floors for rooms at the one end of the building tested might easily run up to 40 or 50 sq. ft. The difference in heating surface requirements between lower and upper floors is thus seen to be of considerable amount even in the case of three or four story buildings. It would, of course, be greater still in taller buildings, although it is reduced when there is not free communication between stories by way of open staircases or other means.

In connection with the matter of extra allowance in square feet of radiation to take care of maximum infiltration, it is to be emphasized that this is not a measure of heat loss by infiltration, but rather an allowance in capacity to meet an extreme or emergency situation. Infiltration goes on to some extent continually so long as there is either a temperature difference or a wind, but not at the maximum rate.

From the studies, it was concluded that temperature effect, even in buildings of moderate height, may be a factor of sufficient importance to require a different allotment of heating capacity as between lower and upper floors. Also, a study of weather bureau records and a general agreement as to the interpretation of data therefrom are highly important in order to better define what shall be considered as wind velocity upon which to determine window leakage.

Air Infiltration Through Various Types of Brick Wall Construction

Since the fall of 1927, a program of co-operative research concerning air infiltration through various types of brick wall construction, sponsored by the American Society of Heating and Ventilating Engineers and the University of Wisconsin, has been in progress. The first results of this research appeared as a paper entitled, Effect of Frame Calking and Storm Windows on Infiltration Around and Through Windows, which was presented at the semi-annual meeting of the society in June, 1928. Preliminary to the report contained herein, a second paper entitled Air Infiltration Through Various Types of Brick Wall Construction, was presented at the annual meeting of the society in January, 1929.

This third report, entitled Air Infiltration Through Various Types of Brick Wall Construction, presented by G. L. Larson, D. W. Nelson and C. Braatz, is in conclusion to the latter paper and contains results obtained on plain, plastered and painted brick walls.

From the tests conducted, it would seem that there is no correlation between infiltration and the aging of the walls. This, of course, is subject to the limitation of the tests conducted between the time of the original and check investigations.

Summarizing the results of the tests, it was concluded that plain brick walls vary greatly with respect to air infiltration. Of the three factors—brick, mortar and workmanship—workmanship seems to be of most importance, the composition of the mortar

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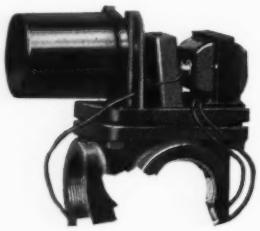

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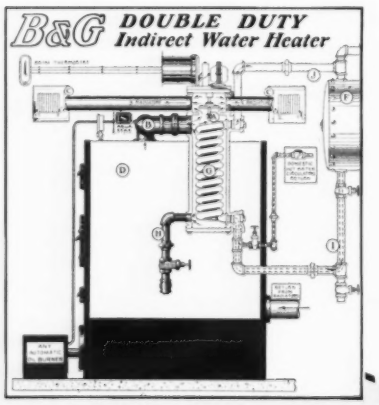

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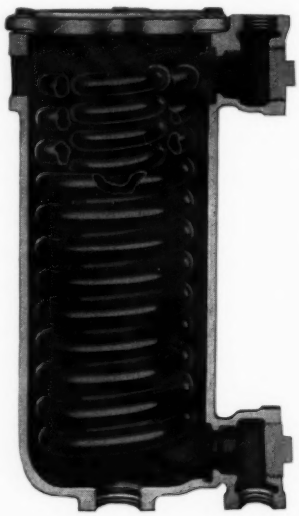

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AIR MAIL SERVICE ON SKETCHES

as to cement and lime content next in importance, and the brick the least important. The infiltration for the 13-in. plain brick walls tested ranged from 2.71 to 10.35 cu. ft. per hour per square foot of walls.

Gypsum plaster, when properly applied, stops almost all infiltration. The results show that plastering stopped about 96 per cent of the leakage of the plain brick wall. Plastering directly on brick seemed to be slightly better than on metal lath with a furring space. The difference is small and the saving due to plastering directly on the brick would be negligible as compared to the saving in heat transmission effected by the furring space in the other construction.

Two ordinary coats of a linseed oil paint applied directly to the surface of a porous brick wall reduced the leakage by 9 per cent. A third coat applied with extreme care made the total reduction in infiltration 28 per cent.

One heavy coat of cold water paint applied directly to the surface of a hard brick wall reduced the leakage by 50 per cent.

Airation Studies of Garages

"The problem of heating rather than that of airation or ventilation is the main reason for the acute condition that at times prevails in garages due to the presence of carbon monoxide." Such were the observations of W. C. Randall and L. W. Leonhard as expressed in their paper on airation studies of garages. Their investigation, reported therein was made to determine the use made of airation or natural ventilation as a means of diluting the carbon monoxide concentration of the air in various types of garages.

Conclusions arrived at for the various types of garages surveyed are as follows:

Multistory Ramp Garage

1. Sufficient air can be furnished through window openings, as natural ventilation, to keep the carbon monoxide concentration below a harmful or even disagreeable degree.

2. Higher concentrations of carbon monoxide were found to occur on extremely cold days when it became necessary to close all or all but a few windows in order that comfortable inside temperatures might be maintained.

3. Tests showed that the carbon monoxide content of the air in this type of garage is practically the same at the floor level as it is five feet above the floor. This is due to the fact that a motor is seldom running unless the car is in motion and the gas is well diffused by the action of cars going up and down the ramps.

4. Rush periods occur between the hours 8:00 a.m. to 9:30 a.m. and 4:00 p.m. to 5:30 p.m. during which periods 60 per cent of the total cars handled throughout the day enter and leave the buildings respectively. The CO concentrations during these periods were found to range from one-half to two parts per 10,000 of air, depending upon the amount of air movement.

5. The carbon monoxide concentration between the rush hours was almost always below one-half part per 10,000 of air which produced no ill effects.

Auto Service Garage

1. Practically no trouble would be experienced from carbon monoxide poisoning in the garages studied if some reasonable percentage of the available ventilation areas were utilized.

2. Where unit heaters are employed, the carbon monoxide is more thoroughly diffused than where direct radiation is used.

3. In the garages studied, sufficient heat was not supplied in cold weather to warm the necessary volume of air to a comfortable temperature.

Private Home Garages

1. A four cylinder motor operating at a racing speed in a two car garage with doors and windows closed would produce a concentration of carbon monoxide which would probably cause death to anyone exposed to it for 10 min. or more.

Pipe and Orifice Sizes for Small Gravity Circulation Hot Water Heating Systems

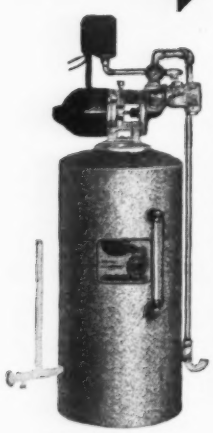
(Continued from Page 56)

If it had been decided to use orifices calibrated for vapor systems or adjustable valves, the sizes or settings would have been as indicated in Table 9. There are two features of Table 9 that require comment. It will probably be noticed that the valve settings are always

Table 8—Arrangement of data for design of hot water system

Radiator Number	Section of Line	Height of Mid-point of Radiator Above Mid-point of Heater	Square Feet for Radiator	Square Feet for Mains	Flow Riser (Table 1)	Return Riser (Table 1)	Flow Main (Table 2)	Return Main (Table 2)	Main Heater Flow Riser (Table 4)	Main Heater Return Riser (Table 4)	Orifices (Table 5)
1	2	3	4	5	6	7	8	9	10	11	12
11	4	8'-0"	160	160	1½	1½	2½	2½	.....	.....	¾
10	4	7'-4"	24	184	¾	¾	2½	2½	.....	.....	⅜
9	3	8'-0"	65	249	1	1¼	3	3	.....	.....	⅜
8	3	17'-0"	21	270	½	¾	3	3	.....	.....	⅜
7	3	17'-0"	50	320	1	1	3	3	.....	.....	⅜
6	2	17'-0"	40	360	¾	1	3	3	.....	.....	⅜
5	2	7'-6½"	51	411	1	1	3½	3½	.....	.....	⅜
4	2	16'-6½"	36	447	¾	1	3½	3½	.....	.....	⅜
3	2	17'-0"	21	468	½	¾	3½	3½	.....	.....	⅜
14	3	7'-6½"	93	93	1¼	1¼	2	2	.....	.....	⅜
13	2	17'-0"	99	192	1¼	1¼	2½	3	.....	.....	⅜
12	2	7'-6"	16	208	½	¾	2½	3	.....	.....	⅜
	Junction of Branches										
...	...	.....	.....	676	.....	.....	4	4	.....	.....	.....
2	1	17'-0"	50	726	1	1	4	5	.....	.....	⅜
1	1	8'-4½"	25	751	¾	¾	4	5	.....	3½	⅜
16	4	7'-8½"	125	125	1¼	1¼	.....	.....	.....	.....	⅜
15	1	7'-6½"	105	230	1¼	1¼	.....	.....	.....	2½	⅝
	Junction	.....	.....	981	.....	.....	5	5	4	.....	.....
No.	3 &	No. 4....	57	.....	1	1	.....	.....	.....	.....	.....

BURKS
SUPER-TURBINE
PUMPS



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DEPENDABLE SERVICE—
Built of the finest materials by expert machinists, Burks Pumps are thoroly dependable.

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Burks Pumps are capable of a suction lift utterly beyond ordinary pumps.
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equal to or larger than the largest number in the corresponding vapor orifice rating. There are two reasons for this. First, the orifices, as nearly as could be determined by measurement, were correct at the upper range —that is, the 41-50 was actually 50, the 51-60 was actually 60, and so on. Thus, in comparing a valve setting to an orifice rating, attention should be given to the larger number in the orifice rating. Second, an orifice that is a little too small does no particular harm, while one that is too large may, to some extent, allow the riser pressure head to interfere with circulation. The orifice, therefore, is never too large, but may be as much as ten units too small. By taking both of the above considerations into account, it will be noted that the valve setting corresponding to a given orifice will nearly always be equal to or larger than the largest number on the orifice, but that it can never exceed it by more than 10. The second feature that requires comment is the limited range of the valve. None of them, so far as has been ascertained, can be set higher than 200. A certain amount of overloading will not do any harm and it is quite possible that these valves might be used successfully on radiators requiring a setting as high as 300, but on the other hand, the writer would hesitate to use them on a radiator requiring a setting of less than 30. When small settings are used the orifice in the valve becomes a narrow slit which might become clogged and cause difficulty.

Table 9—Sizes of settings for orifices calibrated for vapor systems or adjustable valves

Radiator	Section of Line	Height Above Mid-point of Heater	Sq. Ft. of Radiation	Vapor Rating of Orifice	Valve Setting
11	4	8 ft.-0 in.	160	¾ in.	Impossible — must use 2, or better, 3 smaller radiators instead of this large one
10	4	7 ft.-4 in.	24	51-60	62
9	3	8 ft.-0 in.	65	101-110	118
8	3	17 ft.-0 in.	21	11-20	24
7	3	17 ft.-0 in.	50	41-50	59
6	2	17 ft.-0 in.	40	21-30	35
5	2	7 ft.-6½ in.	51	51-60	69
4	2	16 ft.-6½ in.	36	21-30	32
3	2	17 ft.-0 in.	21	0-10	19
14	3	7 ft.-6½ in.	93	151-160	169
13	2	17 ft.-0 in.	99	71-80	88
12	2	7 ft. 6 in.	16	11-20	21
2	1	17 ft.-0 in.	50	21-30	35
	1	8 ft.-4½ in.	25	11-20	24
16	4	7 ft.-8½ in.	125	11-16	Probably would be more satisfactory to use 2 smaller radiators
15	1	7 ft.-6½ in.	105	101-110	110

However, it is probable that the smaller settings recommended for these valves are too small because of the elongated shape of the orifice. There has as yet been no opportunity to test this experimentally, but since small readjustments can readily be made while the system is in operation, it should be easy to make satisfactory installations using these valves.

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SWIFT, sure and straight, the man on the job builds up the pipe line with Stockham Fittings. Never a delay because of poor threads—no going back to replace a leaky fitting. Every connection is true, tight and sturdy where Stockham Fittings are installed.

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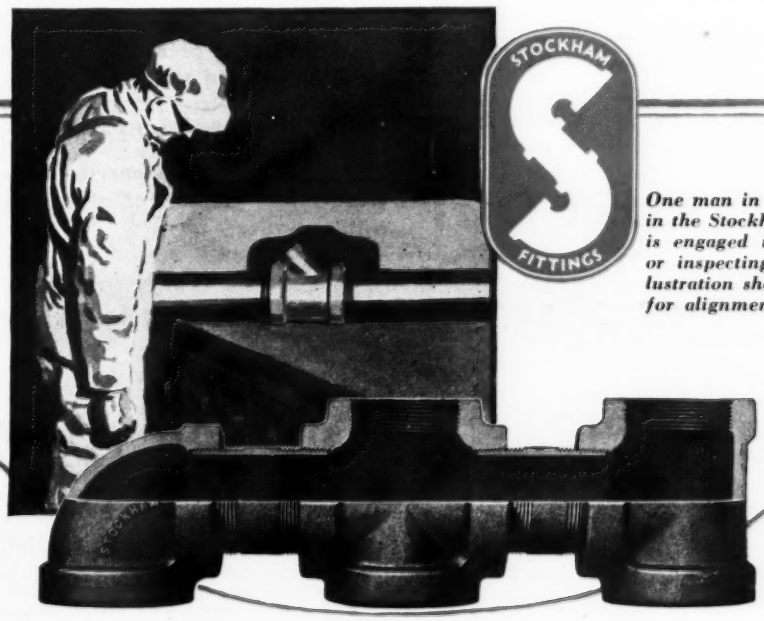

One man in every ten in the Stockham plant is engaged in testing or inspecting. The illustration shows a test for alignment.

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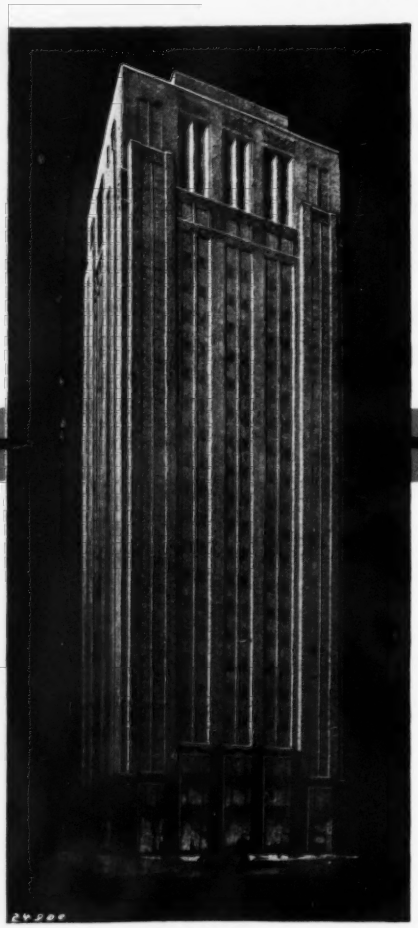

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In the Buckingham Building, Arco Metal Pipe gives permanent protection against rust. The owners of the building have learned through experience that ordinary pipe does not last as long as the building itself. Replacement is costly to the owner and inconvenient to the tenant. Modern design demands much piping that is concealed. Permanence in construction is of first importance. Decay must be conquered, repairs must be minimized.

Cast iron pipe is the safe, durable and economical pipe for building drainage systems, because it is unaffected by the sewer gases and atmospheric conditions.

Because the iron in Arco Metal Pipe is alloyed with nickel and chromium, its texture is uniform throughout the wall of the pipe, and insures its superior corrosion-resisting qualities either at the bottom of its thread or at any point on its surface. The pipe is of the same dimensions as extra heavy wrought pipe. It can be cut and threaded with standard hand or power tools. It can be welded to any length at the factory or on the job.

Arco Metal Pipe is carried in stock and distributed by jobbers of plumbing, heating and mill supplies.

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Summer Service Inspections

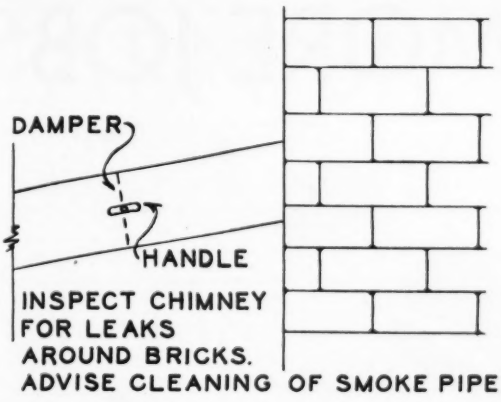


Fig. 1

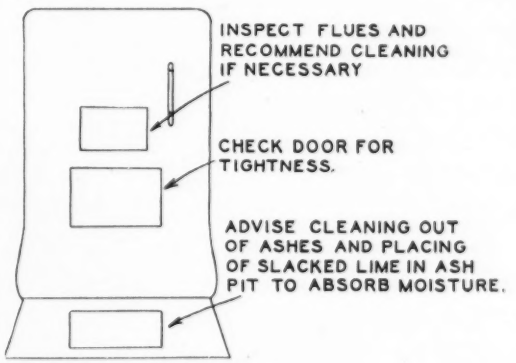

INSPECT FLUES AND RECOMMEND CLEANING IF NECESSARY
CHECK DOOR FOR TIGHTNESS.
ADVISE CLEANING OUT OF ASHES AND PLACING OF SLACKED LIME IN ASH PIT TO ABSORB MOISTURE.

Fig. 2

ANYONE responsible for the heating of his home is very naturally interested in obtaining the best possible results from standpoints of comfort, convenience and cost.

When soliciting summer fill-in business these points can be covered in an advantageous manner through an inspection of the heater followed by reasonable recommendations for adjustments or repairs.

Practically all heating systems are enough alike in principle to permit of following a general system as outlined below for making these recommendations.

Ash Pit and Firepot

In all types of heaters the ashes and refuse should be removed from both the ash pit and firepot. This not only prevents excessive corrosion of the castings and grates which might occur if damp ashes were allowed to remain throughout the summer, but more important from a convenience standpoint it provides a clean firepot when the heater is started in the fall.

A pan of unslaked lime in the ashpit will do much to prevent corrosion by absorbing any moisture which might otherwise accumulate.

Points for the heating contractor to stress in selling inspection service

Boiler Door

If the boiler door is badly warped or cracked it should be replaced, since a door that is hard to close causes inconvenience and often results in draft loss and inability to control the fire. Probably the edge of the door ledge or the hinge pins are worn out in which case a suggestion that they be replaced is timely.

Heating Surfaces

Open the door marked "clean out" and inspect the heating surfaces with a flashlight. If there is an excessive accumulation of flue dirt it should be explained to the customer that only a fraction of an inch of this dirt deposited on the heating surfaces wastes as much heat as would a layer of one inch of asbestos cement. Soot and ashes in flues an inch in depth is not uncommon.

If your company does not provide cleaning service suggest that the boiler be cleaned by a dependable man. This cleaning should of course include a thorough renovation of the smoke pipe.

Damper Controls

Most hot water and steam boilers are fitted with regulators to control the dampers. Any defects in the mechanism, chains or pulleys should be noted and called to the attention of the customer.

Damper Positions

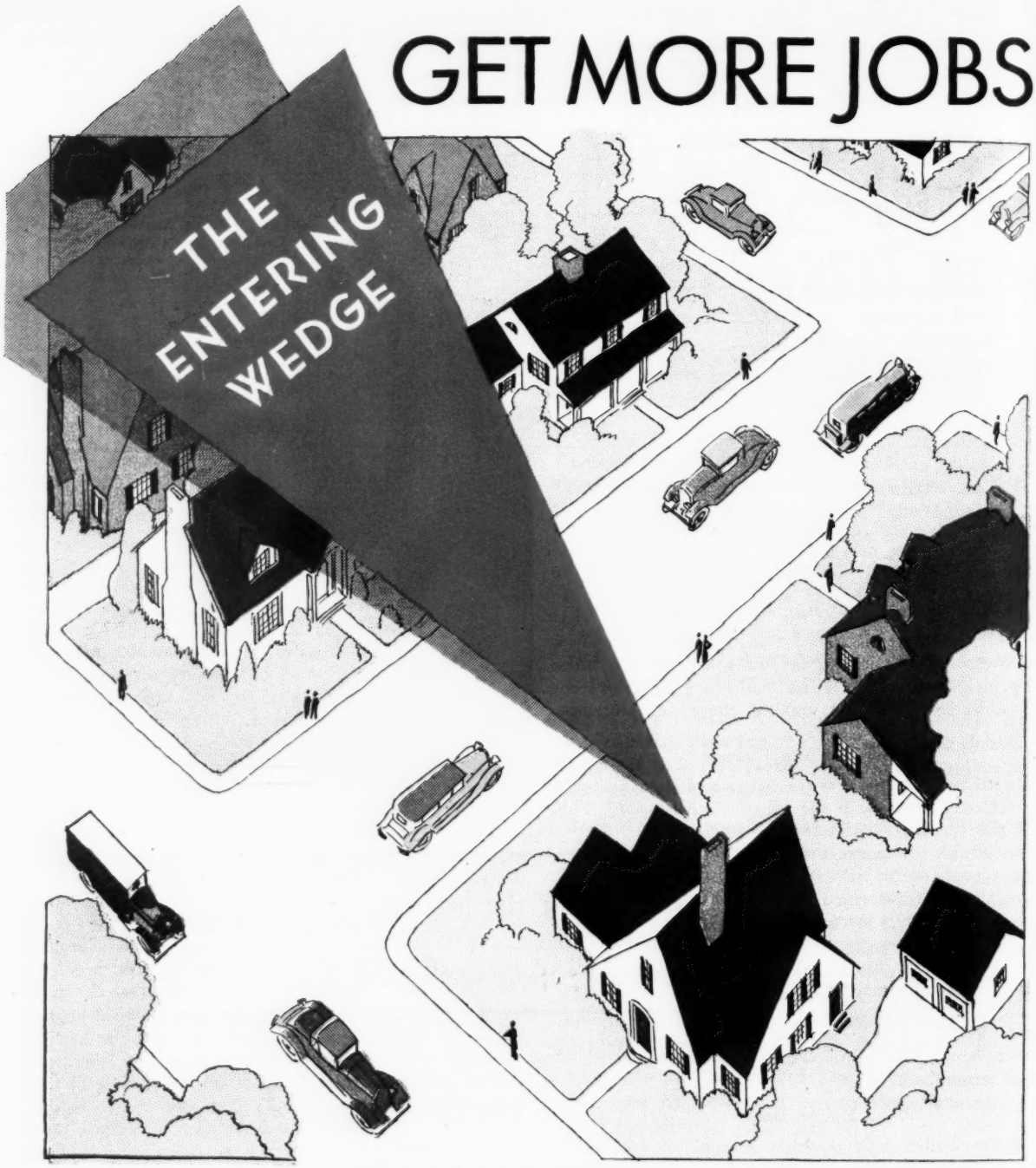
In many instances considerable trouble in controlling the fire has resulted from the fact that the turn damper has become loosened in the shaft to the extent that the handle on the outside of the pipe does not indicate the true position of the damper. This is often defective to the extent that when the customer turns the handle to the point where the damper should be open it is really in a closed position.

Chimneys

The mortar between the bricks of a chimney and around the smokepipe often deteriorates to a point where it is completely eroded by the weather. This condition causes a leakage of cold air into the chimney and often interferes with proper draft.

An inspection such as has been outlined does not require many minutes time yet it is invaluable in holding the good will of the customers especially where it is completed before it is necessary to put the plant in operation. However, the summer season is most disastrous on a dirty boiler.

GET MORE JOBS



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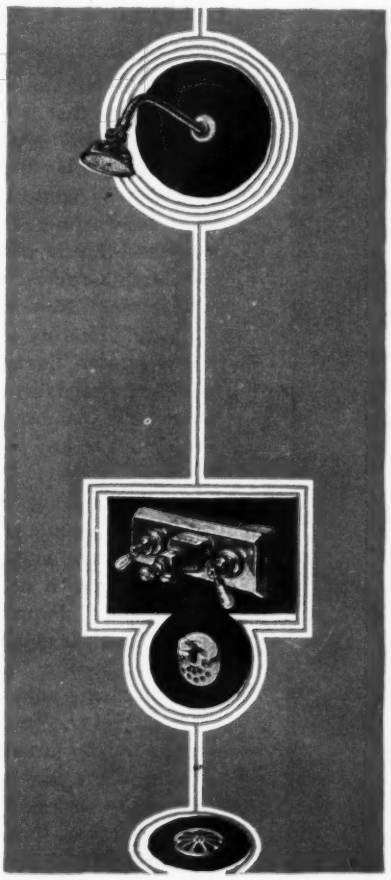

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Onawall fixtures are built in many combinations including diverter fixture for bath and shower; separate fixture for shower or tub; lavatory fixture with exposed, concealed or integral spout. Each offers an opportunity for more jobs and greater profit.

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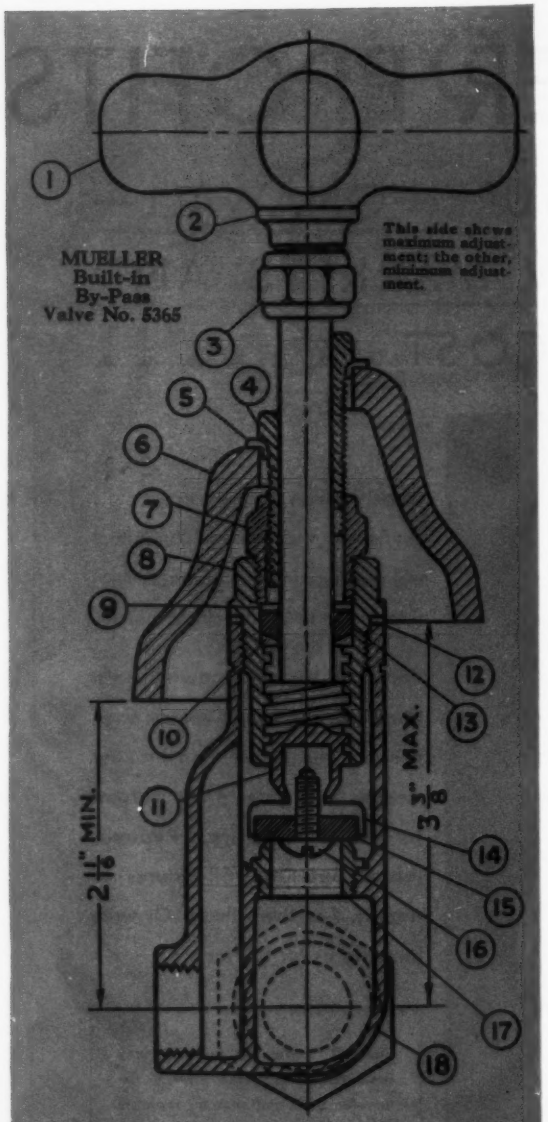


DESCRIPTION

1.	China handle	10.	Bottom friction washer
2.	Brass foundation	11.	Stem
3.	Handle lock nut	12.	Fiber washer
4.	Escutcheon (canopy) sleeve	13.	Packing
5.	Compensating sleeve ring	14.	Swivel disc
6.	Escutcheon or canopy	15.	Seat washer
7.	Gland	16.	Screw
8.	Stuffing box cap	17.	Seat bushing
9.	Top friction washer	18.	Body

Everlasting and trouble-proof service *from this new*

MUELLER

Built-in By-Pass Valve

NOTHING can wear out in this new Mueller Valve that is not easily replaced from the front of the wall—*no wearing parts touch the valve body*. Barring accidents, it will never be necessary to replace the valve itself. The casting is of heavy bronze with a non-porous texture similar to that of plate glass! The seat is renewable and hardened with chromium plating for long service. Renewable sleeve—no thread wear on body. Bearing surfaces are larger—the stem has a greater diameter. The greater waterway provided means less trouble with chips. A liberal escutcheon (canopy) adjustment permits snug connection to any wall. The finished wall line is marked on every valve—saves constant reference to roughing in measurements—easier to rough in. Handle spud is slotted to allow tight wedge to stem when lock nut is tightened. Old style screw with its loose, wabbling handles, is eliminated. Supplied with either chromium plated or white china trim.

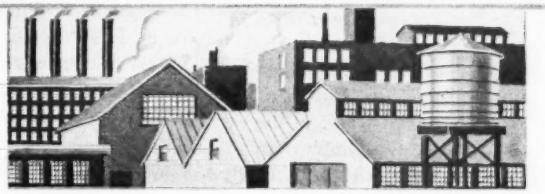
All of which means a better installation all 'round—a job you can be proud of. Mueller quality of design and workmanship is evident here in every detail. Write for complete information. It will pay you to become familiar with Mueller Plumbing Fixtures, as they provide distinct advantages to be found under no other name. MUELLER CO., (Established 1857) Decatur, Illinois. *Branches:* New York, Atlanta, Dallas, San Francisco, Los Angeles. *Canadian Factory:* MUELLER, Limited, Sarnia.

MUELLER

PLUMBING BRONZE AND VITREOUS WARE

SUPPLY NEWS

AMONG MANUFACTURERS, WHOLESALERS AND SALESMEN



Kewanee Boiler Corp. Opens New York Office

The Kewanee Boiler Corporation of Kewanee, Ill., has just announced that it has opened its own office at 35 West 39th street, New York City, with L. W. Charlet in charge as manager. All products manufactured by this corporation will in the future be handled and sold in the eastern territory, only by its own New York Office.

◆

Makes Change in Distributing Branch

The F. E. Myers & Bro. Co., Ashland, Ohio, has discontinued its former transfer house at 101 West Water street in Milwaukee, Wis., and now handles its products from the warehouses of the Atlas Storage Co., 447 Virginia street, Milwaukee. This new arrangement gives the company increased warehouse space and is expected to improve the distribution facilities of the Milwaukee branch.

◆

U. S. Radiator Corp. Elects Officers

At the annual meeting of the stockholders of the United States Radiator Corp., Detroit, Mich., held February 26, the following directors were re-elected to succeed themselves for the ensuing year: Henry T. Cole, George A. Ducharme, Robert J. Gross, Edward E. McNair, Sidney T. Miller, F. T. Murphy, M. J. Murphy, J. Books Nichols and Lewis H. Paddock. On the following day a meeting of the board of directors was held and the following officers were also re-elected to succeed themselves: Henry T. Cole, president; Edward E. McNair, vice president; James E. McIntire, vice president, and W. E. Mosher, secretary and treasurer.

◆

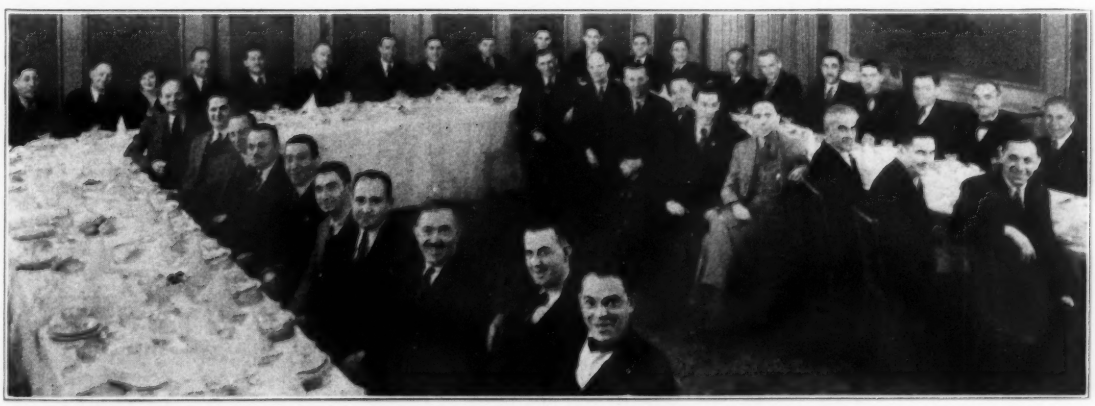
Inland Pipe & Supply Co. Now Its Name

Yakima Plumbing Supply Co., Front and Walnut streets, Yakima, Wash., has changed its name to the Inland Pipe & Supply Co. The personnel of the company and its policies remain unchanged.

◆

New York Wholesaler Has Certificate Selling Plan

At a series of informal dinners held throughout Bronx, Manhattan and Westchester County during the months of January and February by the United Plumbers Supply Co., Inc., New York City, the United plan of purchase certificates, introduced by Charles J. Crockett to help get more jobs at a profit and sell more merchandise, was presented. This plan has been devised in an attempt to solve the contractor's problems and to combat the mail order house and department store selling of plumbing and heating materials. Realizing that the prosperity of the industry depends upon the prosperity of



Dinner given by the United Plumbers Supply Co., Inc., of New York City, to a group of Bronx and New York City master plumbers

all of the three constituents—the manufacturer, the wholesaler and the contractor—this wholesale house has planned the campaign in order to first establish mutual understanding and co-operative action between the wholesaler and the contractor.

The purchase certificates are distributed by the wholesaler to progressive contractors with whom he deals. These contractors upon receiving a book of ten certificates immediately mail or give them out personally to those prospective customers whom they know are planning to remodel or install a new bathroom—a kitchen—or heating unit for the basement. Each certificate entitles the home owner or landlord who receives it to visit, without obligation, the showroom of the supply house which originally issued the certificate and examine its display of fixtures, which are clearly marked and priced to the public. If the visitor selects any fixtures, a showroom specification is made out to the homeowner who pays 10 per cent of the total amount as a down payment, this being credited to the contractor whose customer bought the fixtures. The balance is to be paid to the contractor as per arrangements mutually agreed upon by the contractor and the buyer. The contractor whose name appears on the certificate is immediately notified of the transaction and then he and the homeowner can make arrangements as to the installing of the fixtures.

◆

C. S. Mersick & Co. Opens New Showroom

C. S. Mersick & Co. of New Haven, Conn., has recently opened a new showroom at 1 Whitney avenue, New Haven. On this page is a view of one section of the interior of the showroom and also a front view of the ground floor of the exterior of the building. The new display room consists of two floors, finished in cream and tan, with old gold curtains. On one floor only colored fixtures are displayed, while on the other are white fixtures. William H. Groark is in charge of the showroom.

◆

Los Angeles Showroom of Standard Sanitary Mfg. Co. in New Location

The Standard Sanitary Mfg. Co., Pittsburgh, Pa., has moved its Los Angeles, Calif., fixture display room from 919 West Seventh street to 3251 Wilshire boulevard, in that city, where a modern display room has been installed.

◆

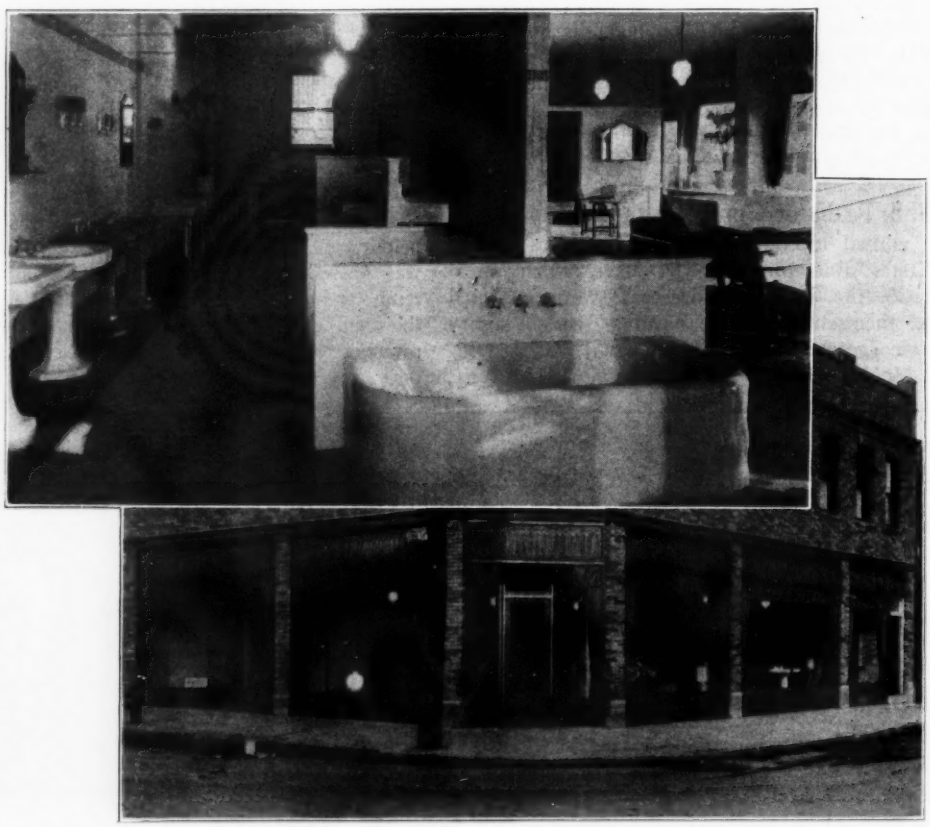
Will Build New Plant

The Stockham Pipe & Fittings Co., Birmingham, Ala., is soon to begin erection of a one-story distributing and storage plant, 50x160 ft., in that city.

◆

D. & T. Mfg. Co. Appoints New Philadelphia Representative

The D. & T. Mfg. Co. of St. Louis, Mo., has established a warehouse in Philadelphia, Pa., and appointed Derbyshire, Mack & Morgan, Inc., as its sales representatives in the Philadelphia territory, with offices at Delaware avenue and South street, in that city.



Interior and exterior views of new showroom of C. S. Mersick & Co., New Haven, Conn.

Is Building Warehouse in Detroit

W. A. Case & Son Mfg. Co., Buffalo, N. Y., is building a warehouse for pipe storage at Beecher avenue and Kales street, Detroit, Mich., in order to improve its facilities in that district.

◆

D. D. Wessels & Sons Co. Incorporates

D. D. Wessels & Sons Co. of Detroit, Mich., has incorporated its business under the same name, with a capital of $125,000, all paid in.

◆

Opens New Branch in Detroit

Detroit Lead Pipe Works, Detroit, Mich., has established a branch at Alma and Hayes boulevard, in that city, which is called the East Side branch. Joseph Quirk, who has covered this district for the company for the past ten years, is manager.

◆

Time-O-Stat Controls Co. Moves Offices

Time-O-Stat Controls Co. has moved its executive and sales offices from the Peoples Gas building, Michigan avenue and Adams street, Chicago, to the Daily News building, 400 West Madison street, that city. The new quarters provide the company with greater facilities for its sales and engineering service.

◆

Hajoca Corp. Branches Join National Pipe & Supplies Association

The National Pipe & Supplies Association has recently announced the addition of four branches of Hajoca Corporation, Philadelphia, Pa., to its membership: the Charlotte, N. C., branch, under the managership of C. J. Lauer; the Richmond, Va., branch, R. E. Saul, manager; the Jacksonville, Fla., branch, C. C. Lowry, manager; and the Savannah, Ga., branch, E. B. Ike, manager.

◆

Ideal Specialty Manufacturing Co. Appoints New Representatives

The Ideal Specialty Mfg. Co., Royersford, Pa., has recently appointed two new sales representatives. Harry A. Jay, 720 North Michigan avenue, Chicago, will cover the territory including Illinois, Wisconsin, Minnesota, Michigan, Indiana, Iowa, Louisville, Ky., and St. Louis, Mo.

The Cowan Sales Co., of 30 Church street, New York City, will represent the Ideal Specialty company in northern New Jersey, New York State and Connecticut.

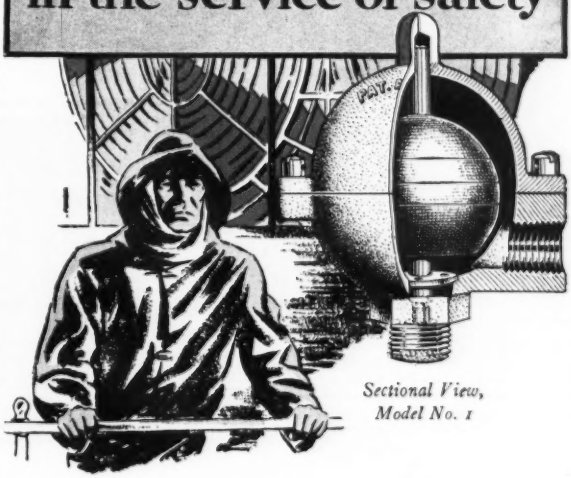
◆

Bryan Steam Corp. Opens Boston Office

The Bryan Steam Corp., Peru, Ind., has recently established an office and warehouse in Boston, Mass., as a distribution point for the company's products in the New England territory. The office, which is at 11 Beacon street, is under the supervision of A. B. Coop.

The Bryan corporation has also increased its sales organization through the addition of William F. Hitzman in the Fort Wayne, Ind., district; E. A. Orpurt, Rockford, Ill., and D. C. Tyner in the Milwaukee, Wis., district.

Shoulder to shoulder in the service of safety



Sectional View, Model No. 1

Red Beacons . . . and Red Tops

Where ships and lives are endangered by reefs and rocks, the lighthouse flashes its guiding red signal in the service of safety.

Also a guide to safety and protection is the distinguishing red top of the Model No. 1 Red Top Relief Valve, which protects domestic hot water supply systems against range boiler and tank heater explosions and other ruptures caused by rising pressures when heaters are accidentally left turned on.

Simple in construction and positive in operation, Red Top No. 1 works on the gravity principle and can be set to relieve at 30, 75, 100 or 130 lbs. pressure.

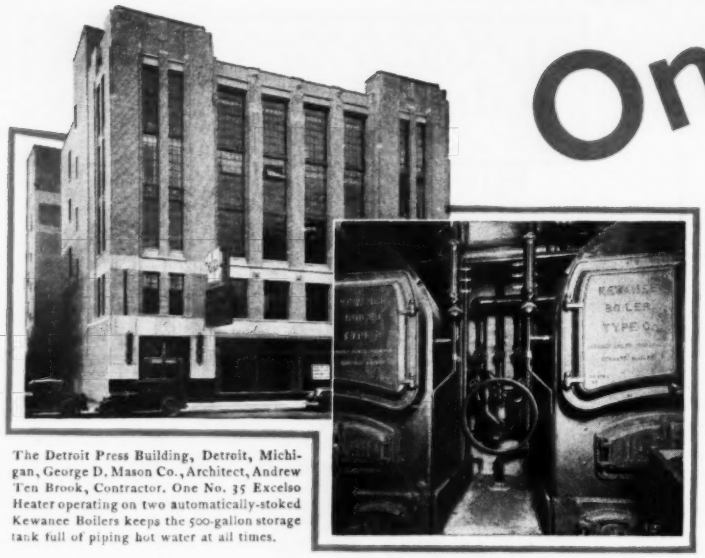
Red Top Model No. 1 as well as Red Tops Model No. 2 and Model No. 3 for hot water house-heating systems, are so reliable in operation that they have the approval of the Underwriters' Laboratories, Inc., America's foremost testing organization.

For complete information send the coupon below.

NEPTUNE METER COMPANY
50 E. 42nd Street New York City, N. Y.
Branch Offices in Principal Cities

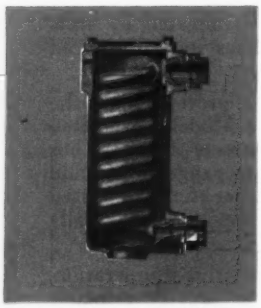
Red Top Relief Valve

NEPTUNE METER CO. D.E. 3-8-30
50 East 42nd Street, New York, N. Y.
Please send me a copy of the new edition of your folder, "Protection," which describes Red Top Relief Valves and their operation.
Name.....
Street.....
City.....
State.....



The Detroit Press Building, Detroit, Michigan, George D. Mason Co., Architect, Andrew Ten Brook, Contractor. One No. 35 Excelso Heater operating on two automatically-stoked Kewanee Boilers keeps the 500-gallon storage tank full of piping hot water at all times.

One of Thousands of Reasons Why DETROIT is enthusiastic about EXCELSO



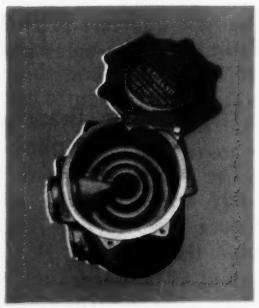
Excelso Indirect Single Coil Water Heater with removable copper coil and patented ground joint brass connections equipped with brass unions. Made in six sizes from 30-to 120-gallon capacities.

THE fine new Detroit Press Building, shown above, is one of several thousand Detroit buildings in which hot water is supplied by Excelso Indirect Water Heaters operating in connection with steam or vapor boilers.

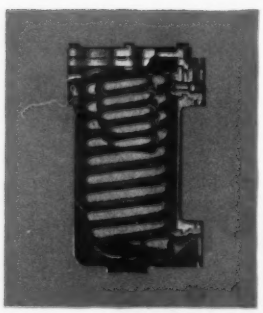
Detroit is sold on Excelso because every one of the thousands of installations there is operating satisfactorily—supplying an abundance of hot water for all purposes at practically no cost of operation—eliminating the care and attention usually required by water heaters—conserving valuable basement space.

The Plumbing and Heating Contractors in Detroit responsible for Excelso Installations and Excelso Popularity have all profited handsomely from their Excelso business. They know from past experience that Excelso Water Heaters are easy to sell for practically every steam or vapor heating plant—old or new—and that there are good profits in Excelso selling. Equally good profits are waiting for you in your territory.

Write for the Profits Story of Excelso Indirect Water Heaters.



Triple Coil Heater with cover plate removed, showing the removable copper coil and patented ground joint brass connections. Made in 600 to 800 gallon capacities.



Excelso double Copper Coil Heater with removable coil and patented ground joint brass connections. Capacities from 160 to 400 gallons.

Excelso Dual Copper Coil Heater with removable coils and patented ground joint brass connections. Capacities up to 2000 gallons.

EXCELSO PRODUCTS CORPORATION
57 CLYDE AVENUE :: BUFFALO, N. Y.
Nationally Distributed by Leading Wholesalers and Boiler and Radiator Manufacturers Everywhere

EXCELSO INDIRECT WATER HEATERS

Sizes to Heat Water for One Family or One Hundred Families

Merchandising Will Be Theme of National Pipe & Supplies Association Convention

Vice President J. Harvey Borton, Philadelphia, Pa., chairman of the convention program of the National Pipe & Supplies Association, has announced that special Pullman accommodations have been secured for members of the association and their guests for the annual convention, to be held at the Carolina hotel, Pinehurst, N. C., on May 5, 6 and 7. These special Pullmans will be made up at Chicago, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Pittsburgh, Washington, D. C., Philadelphia, New York City and Boston. An application for reduced fares is expected to be granted for the benefit of those attending the convention.

Vice President Borton has already outlined the complete program for the organization's annual convention, and many of the details have been cared for. Three other organizations, the brass manufacturers, the enameled ware manufacturers and the National Plumbing & Heating Institute, will hold meetings in connection with the National Pipe & Supplies Association. The subject of "Merchandising," it is announced, will be the theme of this year's convention.

◆

Heating and Ventilating Society Holds Dinner-Dance

The New York University Heating and Ventilating Society held its first annual dinner-dance recently at the Martinique hotel, in New York City. Included in the one hundred and twenty guests present were Collins P. Bliss, assistant dean of the college of engineering with Mrs. Bliss; S. K. Barrett, director of the evening engineering division; J. F. Donnelly, of the Silent Automatic Corp. and Mrs. Donnelly. Dancing followed the banquet during which souvenirs were distributed.

Arrangements for the affair were completed by William G. Kreitner, president of the society; John H. Walsh, secretary and treasurer; John D. Dobak and Walter J. Winquist.

◆

Is Now Moeller Instrument Co.

A. E. Moeller Co. of Brooklyn, N. Y. has been succeeded by the Moeller Instrument Co., Inc., as of February 1. The active ownership and management of the organization remains the same, with the following personnel: Charles E. Moeller, president and general manager; Max E. Moeller, vice president and head of research department; Curt F. Moeller, treasurer and factory manager; Paul G. Moeller, secretary and in charge of sales department; Otto J. Moeller, assistant treasurer and glass production department; Walter G. Moeller, production department.

◆

Detroit Firm Occupies New Plant

The Silent Automatic Corporation of Detroit, Mich., recently moved into its new seven story plant at 12001 East Jefferson street, near the Chrysler factory, providing a greatly increased floor space, according to Walter F. Tant, president of the company.

The Silent Automatic Corp. has recently acquired the patents, processes and methods of the Uni-Lec-Tric Burner Corp. of Paterson, N. J.

Take this Prescription

The best remedy anyone can suggest is prevention. That's what you offer your clients when you offer them *PeerlesS* Garage Drainage Systems, originated by Dehn, S. E., the name that is the accepted name with architects, sanitary engineers and contractors everywhere.

Investigate the Dehn line of sanitary equipment. New Catalog and full information upon request. Your jobber can supply you.

COMPOUND INJECTOR & SPECIALTY CO.

Established 1897

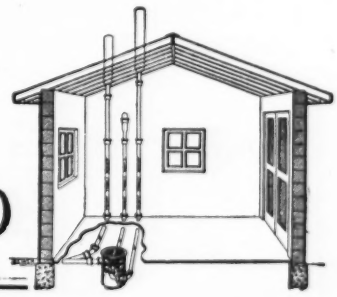
GEORGE J. DEHN, S. E., President

419-421 D N. Laramie Ave., Chicago, Illinois

Originators, Designers and Sole Manufacturers of

DEHNSANIGARD THE QUALITY GOODS

Trade Mark Registered



A Choice of the Best

THAT'S what you get in replies from a "Domestic Engineering" Want Ad.

No matter what your problem—if you want a job or a man for a job, if you have some used equipment to sell or want to buy some, if you want to know what the leading books on plumbing and heating are, if you want bids on a job—a "Domestic Engineering" Want Ad will solve that problem.

Domestic Engineering
1900 Prairie Ave. Chicago, Ill.

The Pipe Cutter with *lifelong* friends

The Genuine Barnes

USERS of *Genuine* Barnes Three-wheel Pipe Cutters are all lifelong friends. Why?

Because best materials, most experienced workmanship, 52 years of concentrated effort—have gone into making this the *best pipe cutter on the market.*

A tool that holds such a place must be quick, cut true, efficient, economical, long-lasting. Try out *Genuine* Barnes for these qualifications.

You'll find this red tag on every Genuine Barnes.

YOU can get the *Genuine* Barnes from your supply dealer. Insist on the *Genuine* Barnes made by the Barnes Tool Co. Comes in 8 sizes, to cut all pipes from *1-8* inch to 12 inches.

The **Barnes Tool Company,** Inc.
Creators of the Genuine Three-Wheel Barnes
New Haven ' ' ' **Conn.**

Domestic Stoker Co. Holds Sales Convention

The third annual convention of the Domestic Stoker Co., New York City, held February 17 in the McAlpin hotel, New York, attracted approximately 150 distributors and salesmen of that company's products who heard talks pertinent to those products and participated in discussions invaluable to successful merchandising. O. F. Ostby, vice president of the company, presiding at the meeting, gave a general talk during the morning session on the various phases of the sales plans for 1930. Following luncheon, at which the company was host, a number of its engineers presented technical papers, among whom were C. H. Hall, who spoke on proper installation; Fred C. Hilder, who dealt with baffle hangers in various types of boilers, and Robert Gevrenz, speaking on air adjustments.

C. Norton Thomas, Long Island distributor gave an interesting outline of how a prospect list may be compiled. A number of other distributors described sales plans that have worked successfully.

A banquet at which Mr. Ostby was toastmaster was attended in the evening. Included among the numerous speakers were A. T. Holley, president of Holley-Smith Co., Hackensack, N. J.; A. F. Duemler, manager New York district of Anthracite Coal Service; Amedee J. Casey, editor American Coal Journal; Col. C. A. Eastman, editor Coal and Coal Trade Journal; Judge E. W. Parker, head of the Anthracite Research Bureau, and C. A. Somner, president of Schanferoke Coal Co.

◆

Philadelphia Plumbsteam Club Meets

The regular monthly meeting of the Plumbsteam Club of Philadelphia, Pa., was held February 14 at the Sylvania hotel in that city. The meeting was called "engineers' night" and H. J. Eggly, Jr., consulting engineer, and Frank E. Hahn, architect and engineer, both of Philadelphia, were the principal speakers. Mr. Eggly talked on salesmanship and offered some excellent points. Mr. Hahn's subject was "progress."

After the regular routine business session, presided over by President W. W. Morgan, John Flemm of the Flemm Lead Works, Inc., Long Island City, New York, spoke briefly on the origin of the club and its progress.

The following new members were accepted: M. Wright, L. Cleary, R. Foster, R. E. Dunn and Frank Martin.

T. Flemming, H. J. Carr, William Brewton and H. R. Sackett were appointed by President Morgan to draw up a suitable testimonial letter to be sent to Mrs. John A. Quinn, widow of the late president of the N. A. M. P.

After the meeting Mrs. Ella Wester Haines of the public relations department of the Philadelphia Electric Company gave an interesting talk.

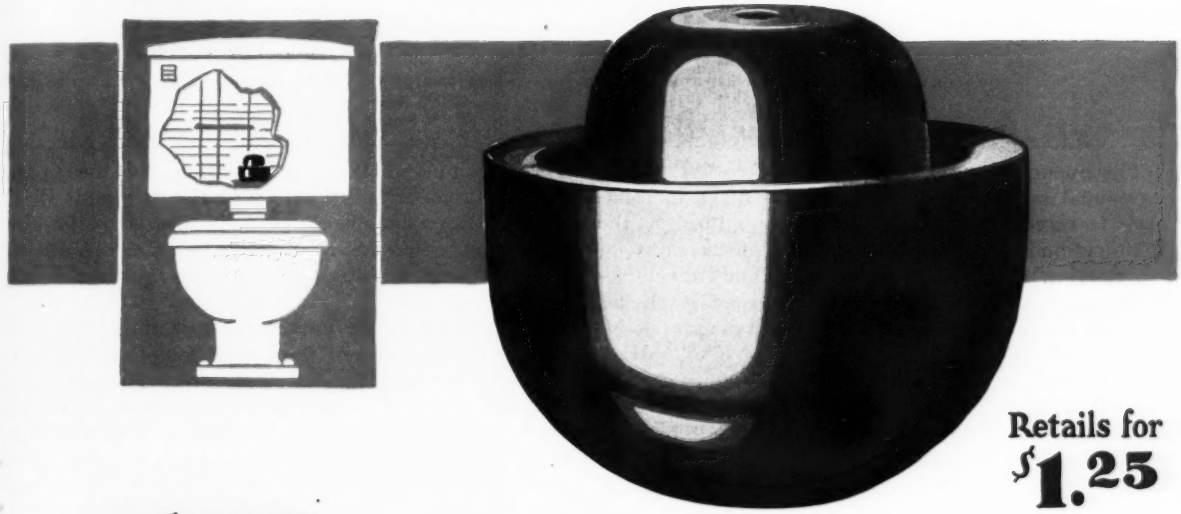
◆

Whitlock Coil Pipe Co. Elects Officers at Annual Meeting

The Whitlock Coil Pipe Co. of Elmwood, Conn., held its annual meeting in February and elected the following officers: J. L. Goodwin, president and treasurer; W. C. Beekley, vice president and secretary; and W. L. Howard, assistant treasurer. Joseph F. Landrigan was elected to fill the newly created office of assistant secretary.

~a new idea of tank ball service~~

CUSHIONED *MUSHROOM* Parabal



Retails for $1.25

Nationally Advertised and Merchandised

This group of national magazines consistently carries *Cushioned* MUSHROOM PARABAL advertising. Combined, they reach one out of every four of your customers and prospects. A complete merchandising campaign is available for you to tie up with this advertising.

New in Shape—the ***cushion*** bottom seals the outlet tighter as water pressure increases, yet lifts with feather lightness.

Long in Life—made of one piece pure gum rubber, this ball will not collapse or swell like ordinary tank balls made from compounded rubber.

Guaranteed to Make Good—a rigid, three-year guarantee to the consumer, with a free ball and installation charge refund to you in any case of failure to make good.

Profitable for You—our national advertising has established the $1.25 resale price, which means that you can get that price and make a worth while profit.

WAW HOUSEHOLD PRODUCTS

WOODWARD-WANGER CO.
1106 Spring Garden St.,
Philadelphia, Pa.

I am interested in the new Cushioned MUSHROOM PARABAL and want to take advantage of your introductory offer as follows:—

☐ Send me 3 Doz. only @ $6.45 a doz.
Send me ☐ Doz. @ $5.95 a doz. to apply on gross deferred shipment plan.

Fill in number of dozen in each size.

☐ 2" ☐ 2¼" ☐ 2½" ☐ 2⅝" ☐ 2¾"

I understand that a complete advertising campaign, including Window Display, Counter Display and Envelope Stuffers will accompany this shipment.

Name.....

Address.....

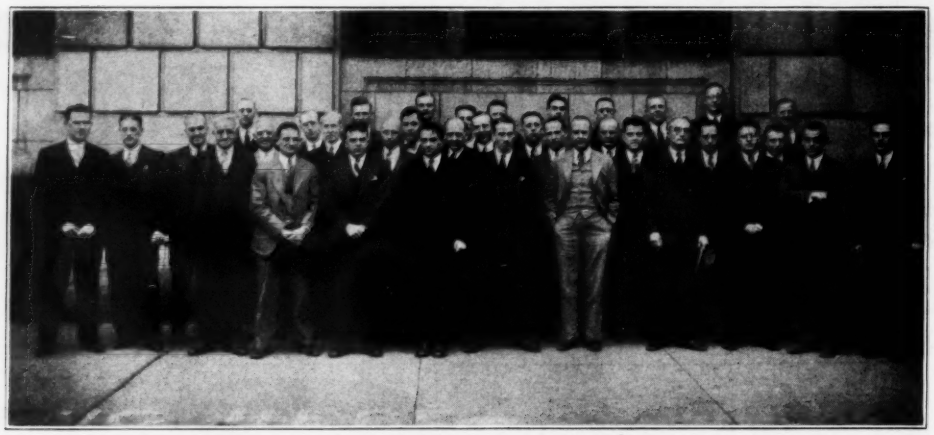


Photo taken at the annual sales meeting of the Spencer Heater Co., Williamsport, Pa.

Spencer Heater Co. Holds Sales Meeting

The Spencer Heater Co. of Williamsport, Pa., held its annual sales conference in Williamsport, in January, featured by an inspection trip through the foundry and assembly plants, and discussions of engineering, sales, credit, advertising and other business policy problems. Papers were read by E. R. Troxell Jr., New York City branch manager; J. M. Kipe, Philadelphia branch manager; E. A. MacDonald, Boston branch manager; A. A. Ahlff, Buffalo branch manager; D. A. Kennedy of the New York branch; D. Reinhardsen of the New York branch; J. G. Howley of the Philadelphia branch; J. A. Smead of the home office collection department and S. M. Washabaugh of the home office sales department.

The meeting lasted through an entire week and closed with the annual banquet held in the Lycoming hotel ballroom, at which C. N. Tull, president of the company, presided.

Among others present besides the foregoing were: S. J. MacMullan, general sales manager for the company; J. A. Waddell, chief engineer; R. H. Wade, New York City branch; Fred Nordstrom, Buffalo branch; and F. W. Earnest, Jr.

Oster-Williams Merger Holds First Sales Meeting

The combined sales organizations of the Oster Mfg. Co., Cleveland, Ohio, and the Williams Tool Corp., Erie, Pa., recently met in Cleveland for the first sales convention of the new Oster-Williams organization, following the recent merger of the two companies.

The sales meeting, under the direction of Arthur S. Gould, secretary of the Oster company and general sales manager for the newly created organization, covered a period of five days. The first two days were spent in a factory inspection trip of the Williams corporation plant at Erie, while the last three days were spent in Cleveland where laboratory demonstrations were made at the Oster plant.

Among those from the field sales force present were, Robert Chelstrom, manager of the Boston office; Harold Thompson and D. Moreinis, New York city; Roy Acord, Buffalo; John Lynn and Harry Van Osten, Chicago; George Lewis, Minneapolis; P. Willis, Los Angeles; Gayle Jones, Atlanta; James Wells, Kansas City; Hiram Gardner, Texas; Ralph Oster and E. Mosher, Cleveland; Howard Oster, Philadelphia; and Harry Liehr, manager of the oil field division.

Oster-Williams representatives attending the sales convention recently held in Erie and Cleveland

They're AIR MINDED *in* HEATING *too —*

To the engineer or student of aerodynamics the advantages of the Modine Heating principle are obvious.

Modine Unit Heaters offer "Directed Heat" —economical, controlled heating.

Suspended from the steam line, 10 to 14 ft. from the floor, Modines deliver heated air down so that it spreads over a wide floor area. As it rises it is picked up, reheated and again circulated down.

Modines are adaptable to all types of space heating. The Stearman Aircraft Corp., above, shows Modine economy of installation. Here, a single steamline and single return are all the piping required. For further information on the economy of Modines, see the following page.

New Catalog 130 now available.
Send for it today.

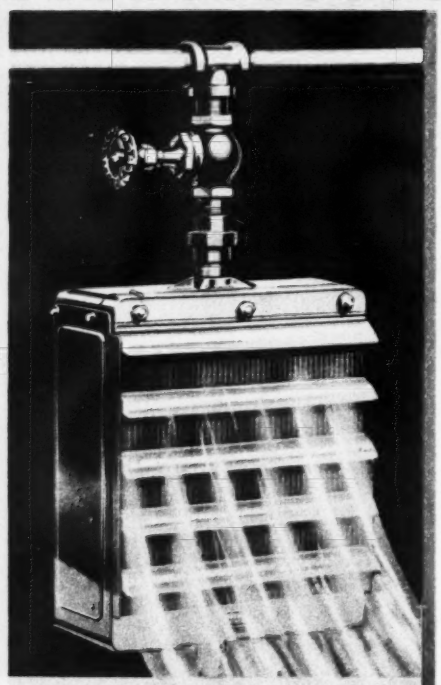
MODINE MANUFACTURING COMPANY

Manufacturers of Unit Heaters
Domestic Copper Radiation » Automotive Radiators
1700 Racine St. (DEPT. A) Racine, Wis.
London Office « S. G. Leach & Co., Ltd. » 26-30 Artillery Lane

Modine *Unit* HEATER

A MODINE Product

© 1930, Modine Mfg., Co.



Economy of Installation

NOTE how the Modine Unit Heater is installed—suspended direct from the steamline.

After steam-pipes are run, placing of each Unit is only a 30-minute job for two men. No braces, straps or supports are needed. That means lowest possible installation cost.

And then, Modine Economy has just begun. Every foot of floor space remains available for productive use. Each Unit, individually controlled, is operated only as required. With the quicker, more efficient distribution of heat, the morning warming up period is cut in half.

An exclusive patented feature of Modine Unit Heater construction is the method of suspension. Steam supply and return lines are at the axis of weight. By simply loosening two unions a Modine Unit may be faced in any direction desired to meet changing conditions. Modines cost less to install and less to operate. They are built to last.

DIRECTED HEAT

UNDIRECTED HEAT MEANS WASTEFUL HEATING

Let us give you further facts in our new Catalog 130. Write today.

*

MODINE MANUFACTURING COMPANY

Manufacturers of Unit Heaters

Domestic Copper Radiation » Automotive Radiators

1700 Racine St. (DEPT. A) Racine, Wis.

Branch offices in all large cities

London Office « S. G. Leach & Co., Ltd. » 26-30 Artillery Lane

Modine Unit HEATER

A MODINE Product

Personal Mention

HENRY M. REED, who recently succeeded Theodore Ahrens as president of Standard Sanitary Mfg. Co., Pittsburgh, Pa., as reported in the February 8 issue of DOMESTIC ENGINEERING, joined the Standard Mfg. Co., which was one of the companies then combining into the Standard Sanitary Mfg. Co., when he was twenty years of age. His first service was in the

Henry M. Reed

enameled ware packing department of the Pittsburgh works of the new company. Later he was transferred to the enamel melting room of which he became foreman in 1902. In 1907 he was selected as assistant manager of the Pittsburgh works and three years later was made manager of the company's factory at Louisville, Ky. He was elected assistant general manager of factories in 1913 and, in 1920, was elected a director of the company. In January 1924, he was elected vice president, general manager of factories and a member of the executive committee and, on the death of J. W. Oliver, first vice president, in December 1928, Mr. Reed became first vice president and chairman of the executive committee. At the time of the merger of the American Radiator Co. and Standard Sanitary Mfg. Co., Mr. Reed was selected as a member of the executive committee and a director of the American Radiator & Standard Sanitary Corp. He assumed the office of president of the Standard company on February 1. Mr. Reed was educated in the public schools of Pittsburgh and attended the Western University of Pennsylvania for several years.

HENRY W. LETCHER has been appointed Metropolitan New York representative for the Union Sanitary Works of the N. O. Nelson Mfg. Co., Noblesville, Ind. Mr. Letcher's offices are at 50 Church street, New York City.

W. T. HUNTER, president of A. Schrader's Sons, Inc., acquired by the Scovill Mfg. Co., Waterbury, Conn., a short time ago, has been elected a director of the Scovill company. FRANCIS T. WARD of J. P. Morgan & Co., New York City, was also added to the board of directors of the Scovill Mfg. Co. at the annual meeting held February 11. The former board and officers were re-elected for another term at the same meeting.

HOWARD E. CRUM, JR., manufacturers' representative, with offices in the Wrigley building, Chicago, has recently taken on the line of Northern Indiana Brass Co., Elkhart, Ind., for Illinois, Wisconsin, St. Louis, Mo., Indianapolis, Ind., and Detroit, Mich. Mr. Crum is also the representative of D. D. Wessels & Sons Co., Detroit; Dick Bros., Inc., Reading, Pa.; and Frank Wiedeman Co., Milwaukee, Wis.

Howard E. Crum, Jr.

RAYMOND D. BITZER, formerly with Walworth Co.'s Philadelphia branch, and recently appointed Eastern sales representative for Modern Utilities Co., Harrisburg, Pa., is now representative for Bell & Gossett Co., Chicago, Ill.; W. A. Russell & Co., New York City; and Milwaukee Valve Co., Milwaukee, Wis., covering Washington, D. C., Baltimore, Md., and eastern Pennsylvania, with offices at 3142 North Broad street, Philadelphia, Pa.

J. F. MCINDOW, formerly manager of the Portland, Ore., branch of the American Radiator Co., has been transferred to Seattle, Wash., and E. L. WILKINS, previously in charge of the Spokane, Wash., office, has been transferred to the Portland branch.

B. W. BRADFORD has been appointed district manager for the Josam Mfg. Co., Michigan City, Ind., in the Atlanta, Ga., territory, with headquarters at 84 Edgewood avenue, N. E., Atlanta. Mr. Bradford formerly had charge of the North Carolina territory for the company. F. M. WILCOX, former district manager in Atlanta, has been transferred to the New York office of the Josam company.

George B. Shawn

GEORGE B. SHAWN, associate director of the American Gas Association testing laboratory at Cleveland, Ohio, has resigned to accept the appointment to the post of chief engineer of the B-Line Boiler Co., manufacturers of gas heating equipment. Mr. Shawn joined the staff of the A. G. A. testing laboratory in June, 1925, at the time the work there was being organized, as laboratory supervisor. He has had general supervision of all testing with particular reference to research in connection with approval requirements and mixed gas research. Prior to joining the A. G. A., Mr. Shawn spent several years with the United States Bureau of Standards in the field of burner design research in comparative studies of appliance operations on gases of various kinds and in the study of combustion with all kinds of domestic appli-

An Extra Measure of Experience

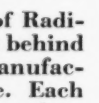
The Moore line of Radiator Hangers has behind it a wealth of manufacturing experience. Each Moore Hanger has four outstanding features:

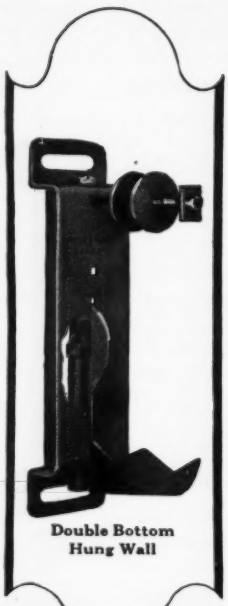
1. **Accuracy**
2. **Uniformity**
3. **Strength**
4. **Adjustability**

When you install a Moore, you know that all of these points are built in.

Ask your jobber.

CARTY & MOORE ENGINEERING CO.
(Incorporated)
611 W. Larned Street
Detroit, Michigan





Double Bottom Hung Wall

MOORE RADIATOR HANGERS

Range Boilers

TANKS *for* Automatic Heaters

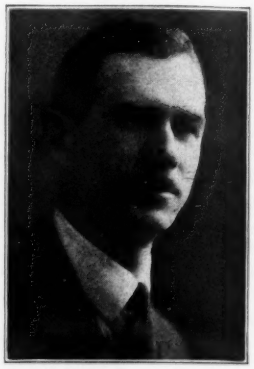
To Your Specifications

COIL BOILERS
STORAGE TANKS
Pressure and Special
of All Descriptions

Riveted and Welded — Black and Galvanized

PENNSYLVANIA RANGE BOILER CO.
Main Office and Plant:
S. W. Cor. 24th and Washington Ave., Philadelphia

ances. He is joint author of Technologic Papers 193, 22, 303. Mr. Shawn's engineering training was received at Johns Hopkins University and George Washington University. He served 15 months overseas with the regular army beginning in 1917 and was later appointed to West Point. He resigned after two years there to join the United States Bureau of Standards.



C. S. Bigelow

C. S. BIGELOW has recently been appointed sales manager of the Milwaukee Valve Co., Milwaukee, Wis. Before joining the Milwaukee Valve Co. Mr. Bigelow was associated with the Capitol Brass Division of Bohn Aluminum and Brass Corp. of Detroit, Mich., handling plumbing and heating sales at Detroit and previously in the Philadelphia territory.

BYRON K. EATON, sales manager in the Chicago district for the oil burner division of the Winslow Boiler & Engineering Co. of Chicago, has recently been elected to the presidency of the Chicago Oil Burner Association.

LEE P. HYNES, electric heating engineer, formerly located at 30 Church street, New York City, has removed his general offices and laboratory to 240-242 Cherry street, Philadelphia, Pa.

WILLIAM J. HAYES, JR., who was formerly with the Hajoca Corp. of Philadelphia, Pa., working in that territory, has been made manager of the Hajoca Corp. branch at Chester, Pa.

G. W. BUSH has established a plumbing specialty business at 203 East 46th street, New York City. Mr. Bush was for a number of years connected with Josam Mfg. Co. and until recently as New York branch manager.

DR. JAMES ASTON, director of mining and metallurgy at the Carnegie Institute of Technology, and consulting metallurgist of the A. M. Byers Co., Pittsburgh, Pa., has been awarded the Robert W. Hunt Medal by the American Institute of Mining and Metallurgical Engineers for his paper on "A New Development in Wrought Iron Manufacture." The presentation was made at the annual dinner of the engineering organization on February 19, at the Commodore hotel, New York City.

E. A. MACDONALD, formerly heating engineer with the Hajoca Corp. at Allentown, Pa., has been appointed New England branch manager for the Spencer Heater Co. of Williamsport, Pa., with headquarters at the company's Boston office, located at 216 Tremont street, in that city.

W. S. BABSON, member of the directorate of the Consolidated Supply Co., Portland, Ore., accompanied by Mrs. Babson, will return early in March from an extended eastern trip. En route home, visits will be made at Havana and the Canal zone. Mr. Babson headed the Peerless Pacific Co. previous to its being merged with the Consolidated Supply Co.

L. E. PELLETIER has become a representative of the Jenkins Mfg. Co., Bloomfield, N. J. Mr. Pelletier, who was connected with the Hutchison Regulator

A steam trap *tested-in-the-making* now offered by GRINNELL

GRINNELL COMPANY has discovered the one trap which meets its own exacting standards. It is a discovery of great importance because never before could a trap be tested in its making.

The heart of this ThermOflex trap is the Hydron bellows. By the process of its manufacture, each and every Hydron bellows must stand up under a pressure several times as powerful as it will ever be given on any piping job.

"What! Tested in the Making?"

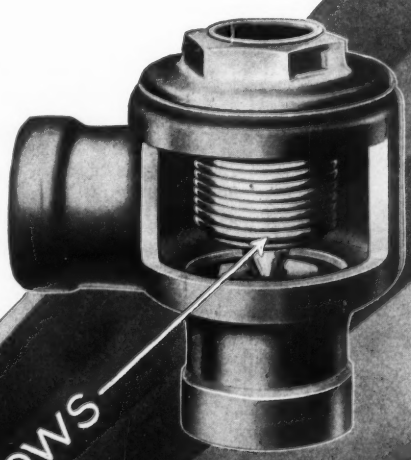
The famous ThermOflex Hydron bellows is formed from the original tube by several hundred pounds internal hydraulic pressure. That is why this sturdy yet sensitive bellows will open and close millions of times without any signs of giving out.

The end fitting is joined to the tube *before* the hydraulic pressure shapes it into a bellows. Therefore, the tremendous internal pressure also tests the end fitting far beyond any pressure the bellows will ever be called upon to stand. Any weakness in either the tube or the end fitting would then and there destroy the bellows. Thus the ThermOflex Hydron bellows is *self-inspected* and *proof-tested in the making*.

Grinnell Company is the exclusive distributor for these traps. Years of unfailing service in all types of buildings and under severe and varied conditions have proved their unfailing value, their uniformly high quality, their long efficient service.

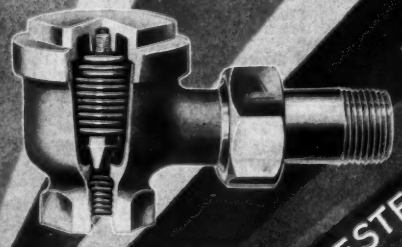
Let our sales engineers work with you to insure permanent satisfaction.

THERMOFLEX TRAPS



HYDRON BELLOWS

TESTED IN THE MAKING



No. 12 ThermOflex Radiator Trap
Body is extra heavy throughout, using a brass forging for the cap and spudnut, highest-grade cast brass for the body and spud.

No. 4 ThermOflex Drip Trap
For dripping mains, risers, coils and unit heaters, we offer this type of trap. Cast-iron body, brass cap and inserted brass seat, angle pattern only, without unions.

GRINNELL COMPANY

Executive Office: Providence, R. I.

Branches in all Principal Cities

GRINNELL COMPANY, INC.
305 W. Exchange St., Providence, R. I.

I want to read more facts about ThermOflex Traps. Send along your bulletin giving capacities and dimensions.

Name_____
Title_____
Firm Name_____
Address_____

$100.00 in GOLD

HERE is an opportunity to win some easy money! Old boy "X" Liquid wants to know how many mistakes the artist has made in the picture shown and will pay cash for the information.

Contest ends March 31st, 1930, at midnight but get your answer into the mail today. All tying contestants will receive the prize tied for.

SOME EASY MONEY FOR YOU!

Find the mistakes and win a Prize

To the one who sends a list of the greatest number of "mistakes," together with the name of the magazine in which this picture appears we offer these prizes:

First Prize	$25.00	Six (6) Prizes of	$5.00 each
Three (3) Prizes of	10.00 each	Fifteen (15) Prizes of	1.00 each

Are you one of the 30,000 plumbers and steamfitters profiting with "X" Liquid? You can profit by going after all repair business aggressively and use it as a back-log for your new building business. A dollar is a dollar whether earned from repair jobs or from new contracts.

"Just pour "X" Liquid in" and watch the profits come your way. Order a Carton of "X" Liquid from your wholesaler today.

"X" LABORATORIES, 25 W. 45th St., New York, N. Y.

"X" LIQUID

Repairs Leaks in High and Low Pressure Boilers and Hot Water Heating Systems

Sales Corp., New York City, has in his new position been assigned to the metropolitan New York territory.

R. S. BEALE, formerly of Electrol, Inc., St. Louis, Mo., has been appointed sales manager in charge of the dealer division of the Silent Automatic Corporation of Detroit, Mich. Mr. Beale's office is located at the main factory in Detroit. M. B. ELLS has been appointed assistant sales manager.

W. P. DAVENPORT, vice president of William H. Page Boiler Co., New York City, with Mrs. Davenport, is spending a few weeks at St. Petersburg, Fla.

FENTON B. TURCK, JR., has been made vice president of the American Radiator and Standard Sanitary Corp., New York City. Mr. Turck was previously vice president of the American Radiator Co.

H. T. RICHARDSON, vice president of Richardson & Boynton Co., New York City, and chairman of the Board of the Institute of Boiler and Radiator Manufacturers, recently returned from a visit to Bermuda where he and Mrs. Richardson spent several weeks.

JOHN HICKEY, inventor and designer, formerly with the National Pipe Bending Co., New Haven, Conn., has again joined the engineering staff of that company. Mr. Hickey has assumed his new duties and is in direct charge of engineering in connection with research and new product development.

G. WELDON SAMUEL, who for a number of years was associated with his father, Charles J. Samuel, in the plumbing and heating business in Montclair, N. J., has joined the sales force of Speakman Co., Wilmington, Del.

◆

Death of William H. Baker

William H. Baker, secretary and general purchasing agent of the N. O. Nelson Mfg. Co., St. Louis, Mo., died recently at his home in St. Louis. Mr. Baker had been connected with the Nelson company for about forty years, having served as secretary and general purchasing agent for the last ten or twelve years.

◆

Death of Frank C. Greider

Frank C. Greider, district superintendent for the Portland, Ore., branch of the Standard Sanitary Mfg. Co., Pittsburgh, Pa., died in his 40th year at Portland, early in February. He had been with the company eight years.

◆

Death of W. J. Roberston

W. J. Roberston, assistant manager of the San Francisco, Calif., branch of Crane Co., Chicago, and for the past forty years a resident of Oakland, died in his 66th year at the Peralta hospital, Oakland, following a brief illness.

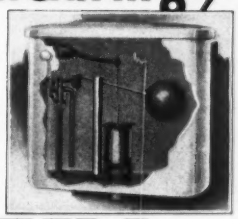
◆

Mrs. C. B. Nash Dies in Florida

Mrs. Bertha M. Nash of Pittsburgh, Pa., died in Sarasota, Fla., on February 17. Mrs. Nash was the wife of Charles B. Nash, director of publicity for the Standard Sanitary Mfg. Co., Pittsburgh. Besides her husband, Mrs. Nash is survived by a son and three daughters.

Quiet and Enduring

Regular equipment in the finest units of fine pottery manufacturers.



install CURTIN TANK NOISELESS FITTINGS

A.F. CURTIN VALVE CO., MEDFORD, MASS.

It Pays to Use the NEW BEAVER

Easy-Cutting Die Stocks

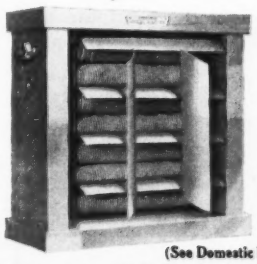
Square-End Pipe Cutters and Power Drives

WRITE FOR CATALOG No. 18

THE BORDEN COMPANY 810 DANA AVE. WARREN, OHIO

SPEED HEATERS

"More Heat Less Steam"



DESIGNED and priced for contractors, SPEED HEATERS will put you a lap ahead in bidding and give you a good profit in the bargain. Clip this ad to your letterhead and we'll send you the whole story.

B. F. STURTEVANT CO.
Hyde Park, Boston, Mass.
Branches in Principal Cities

Sturtevant

(See Domestic Engineering Plumbing and Heating Catalog)

YOUR FITTING PROBLEM IS SOLVED when you say "SQUARE GEE'S"

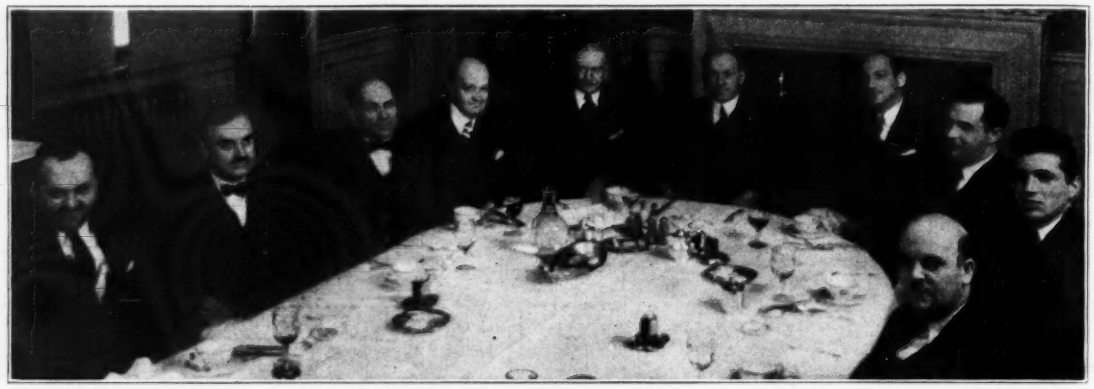
SQUARE Pipe

G

"GEE" Fittings

MALLEABLE, CAST IRON DRAINAGE, BRASS

THE GRABLER MANUFACTURING CO. and its subsidiary GRABLER-REPUBLIC, Inc.
New York ..... Chicago · CLEVELAND, OHIO · San Francisco · Los Angeles



Luncheon of sales executives of the Tirrill Gas Machine Corp., at the Engineers Club, New York City

New Jersey Salesmen Hold Ladies' Night

The sixth annual ladies' night dinner and dance of New Jersey Chapter No. 1, Association of Plumbing and Heating Salesmen, was held Friday evening, February 21, at Toni's restaurant in Newark, and the affair proved to be most enjoyable. There were approximately 80 persons present, including wives and guests of the salesmen.

A delicious course dinner was served, followed by dancing. The entertainment committee deserves considerable praise for its untiring efforts in arranging the party.

The committee was composed of F. L. Dodson, chairman, John J. Lawler, R. H. Jones and Sidney Waller. President E. M. Robinson presided at the head table. Seated with him were the other officers of the association and the honor guest, W. W. Morgan of Philadelphia, Pa., national president of the association. Favors were distributed to all the ladies and balloons to everyone.

◆

Tirrill Gas Machinery Corp. Adopts New Program

Sales executives of the Tirrill Gas Machine Corporation met at the Engineers Club in New York City on February 8. The new program of the reorganized company dealing with co-operation with the plumbing and heating contractors was discussed at some length. Robert A. Jack of DOMESTIC ENGINEERING was present and in a short address analyzed merchandising conditions and opportunities in the plumbing and heating industries.

With a thermal efficiency greater than any other similar product. With the lowest net installation cost, it is easy to account for the constantly increasing demand for MINFELT INSULATING CEMENT.

Conveniently shipped and handled in "one-man" bags

Characteristics

Suitable for temperatures up to 1650 degrees F.

Easy to mix, add fresh water only.

Easy to apply. Experienced labor not required.

Not affected by vibration.

Will not crack by expansion and contraction.

Write us for samples and prices

Mineral Felt Insulating Co.
Toledo, Ohio

A Plumber Named It!

THE FIRST ONE WHO SAW OUR NEW FIREPOT

Water Heater

SAID:

"HOT DOG!"

That's the Shape I Want, and With No Leaky Joints!"

A Free Sample and Special Price on Your First Order.
Ask Us or Your Jobber

IRON OR BRASS
No. 1—20 to 40 Gals.
No. 2—40 to 50 Gals.

TO WHOLESALERS!
Have'em You'll Show'em!
Show'em You'll Sell'em!

The RICHMOND FOUNDRY & MANUFACTURING CO Inc.
RICHMOND, VIRGINIA
"A DEPENDABLE SOURCE OF SUPPLY"

New Officers Installed at Wilmington

The Master Plumbers' Association of Wilmington, Del., at its annual election of officers recently, installed James P. Ponsell, president; Harry Triggs, vice president; James Wharry, treasurer, and Harry Bell, secretary. Arrangements were completed for the dinner dance the association had planned for February 20 at the Elks Club, that city.

◆

Zone Meetings Held in Virginia

A series of zone meetings which embraced practically all sections of the state has just been concluded by W. E. Coley, Norfolk, president of the Virginia Associated Plumbing and Heating Contractors, and C. F. De La-Barre, who is at Virginia Polytechnic Institute in the interests of the plumbing and heating fellowship which was established by the state association. The meetings were for the purpose of outlining the V. P. I. educational work.

◆

Maryland Secretary Recovers from Illness

John W. Clark of Baltimore, executive secretary of the Maryland State Master Plumbers' Association, has recently returned to his office after an illness which confined him to his home for eight weeks.

Convention Dates

March 10 and 11, 1930—KANSAS—The annual convention of the Kansas Master Plumbers' Association, to be held at Salina, with headquarters at the Hotel Clayton.

March 10 and 11, 1930.—NEW YORK—The thirty-fifth annual convention of the Heating and Piping Contractors New York State Association to be held at Albany, with headquarters at the Ten Eyck hotel.

March 10, 11 and 12, 1930.—INDIANA—**The thirty-fourth annual convention of the Indiana Society of Sanitary Engineers, to be held at Fort Wayne, with headquarters at the Hotel Anthony.**

March 11 and 12, 1930—MAINE—The annual convention of the Maine State Master Plumbers' Association, to be held at the Falmouth hotel, Portland.

March 17 and 18, 1930—MISSOURI—The annual convention of the Missouri State Association of Master Plumbers, to be held in St. Louis, with headquarters at the Hotel Statler.

March 19 and 20, 1930—NEBRASKA—The annual convention of the Nebraska Master Plumbers Association, to be held at Lincoln, with headquarters at the Cornhusker hotel.

March 25 and 26, 1930.—C. S. A.—The 104th regular meeting of the Central Supply Association, to be held at the Palmer House, Chicago.

March 25, 26 and 27, 1930—MICHIGAN—The annual convention of the Michigan State Association of Master Plumbers, to be held at the Hotel Hayes, Jackson, Mich.

April 7 and 8, 1930.—ARKANSAS—The annual convention of the Arkansas Master Plumbers' Association, to be held at Fort Smith, with headquarters at the Ward hotel.

April 7 to 12, 1930.—AMERICAN OIL BURNER ASSOCIATION—The seventh annual convention and exposition of the American Oil Burner Association, to be held at the Stevens Hotel, Chicago, Ill.

April 8 and 9, 1930—NEW YORK—The annual convention of the New York State Master Plumbers' Association, to be held in New York City, with headquarters at the Hotel Pennsylvania.

April 14 and 15, 1930.—WISCONSIN—The annual convention of the Heating and Piping Contractors Wisconsin Association, to be held at Sheboygan, with convention headquarters at the Association of Commerce rooms.

April 14, 15 and 16, 1930.—TEXAS—The annual convention of the Associated Master Plumbers of Texas to be held at Abilene, with headquarters at the Hilton hotel.

April 19, 1930.—MONTANA—The annual convention of the

JENKINS

TESTED J BRASS FITTINGS

Jenkins Mfg. Co.
Bloomfield, N. J.

36% MATERIAL 60% LABOR 4% PROFIT
40% 51% 9%

How do You Spend Yours?

TWO contractors were handed $100 each to install valves on two identical jobs. Any remaining surplus would be theirs.

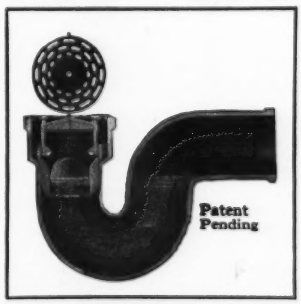
One decided to save money on materials. So he spent $36 for valves which cost him $60 to install. This left him a profit of $4.

The other decided that good materials would cost less to install so he spent $40 for O-B valves and they cost only $51 to install. This left him a profit of $9. How do you spend yours?

Ohio Brass valves are so designed and machined as to give "an extra profit in the make-up".

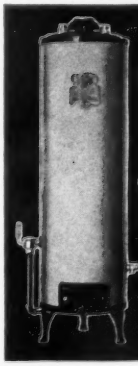
Ohio Brass Co.
1189-V Mansfield, Ohio

THE "GUARDIAN"
IN-A-HUB
BACK PRESSURE
DEVICE



Now it is an easy matter to install on existing work a positive and efficient backwater trap. "In-A-Hub" can be put entirely within a hub and yet it is remarkably efficient in operation. Ask your jobber to show you "In-A-Hub" or write direct to us for full information.

J. A. ZURN MFG. CO. :: ERIE, PA.



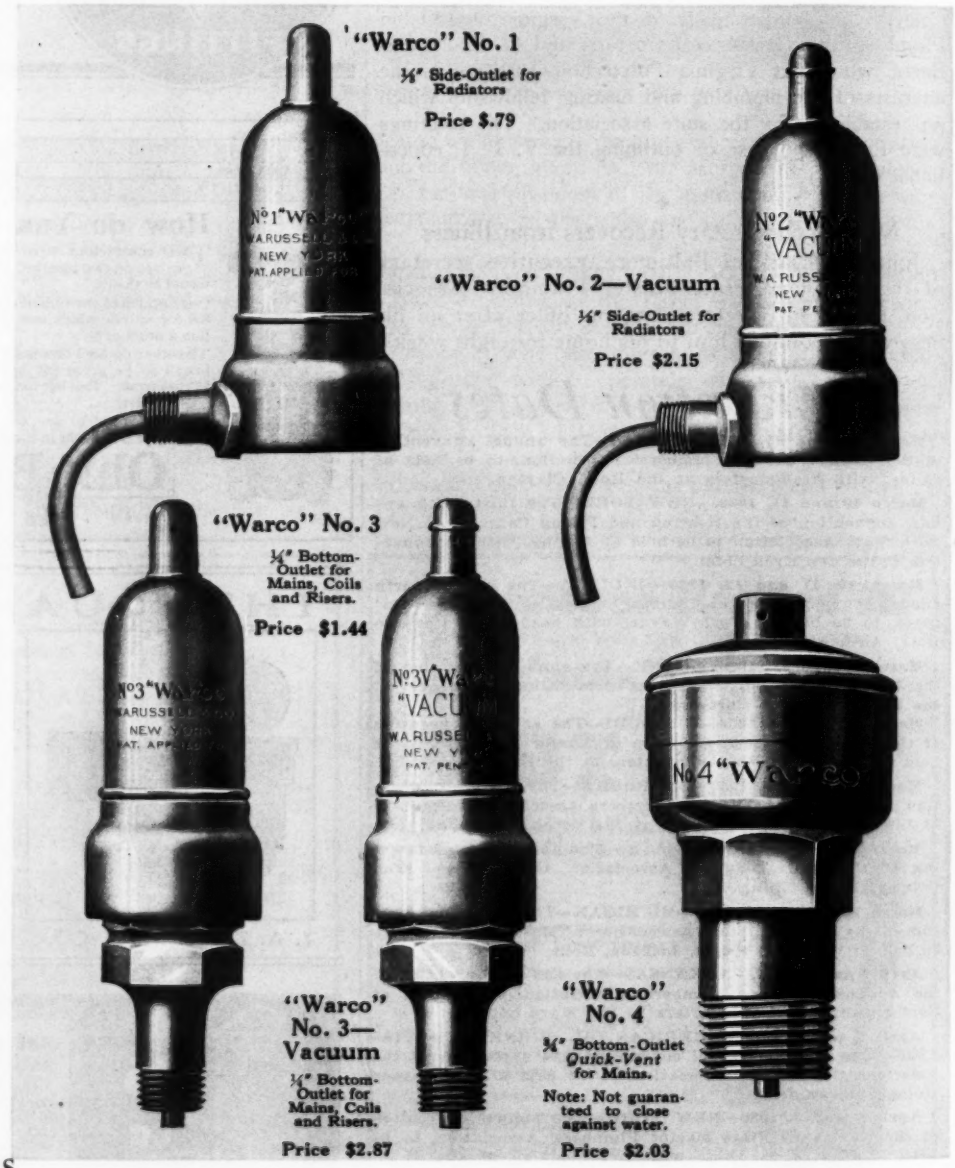
$75 to $295

THE WIEBKE COMPANY, Indianapolis Plumbers, say:

"Our experience with Ever-Hot Heaters, which now dates over a period of practically ten years, has been extremely satisfactory. We recommend the EverHot to our customers knowing they will be completely satisfied."

EverHot Heater Co.
Detroit, Michigan
Branches and Sales Offices in 64 Cities in United States and Canada

THE 40TH YEAR OF THE WORLD'S



WHOLESALERS

Write for our Standard Order Form and Standard Selling Policy, designed for your convenience.

PIONEER AIR VALVE MANUFACTURERS

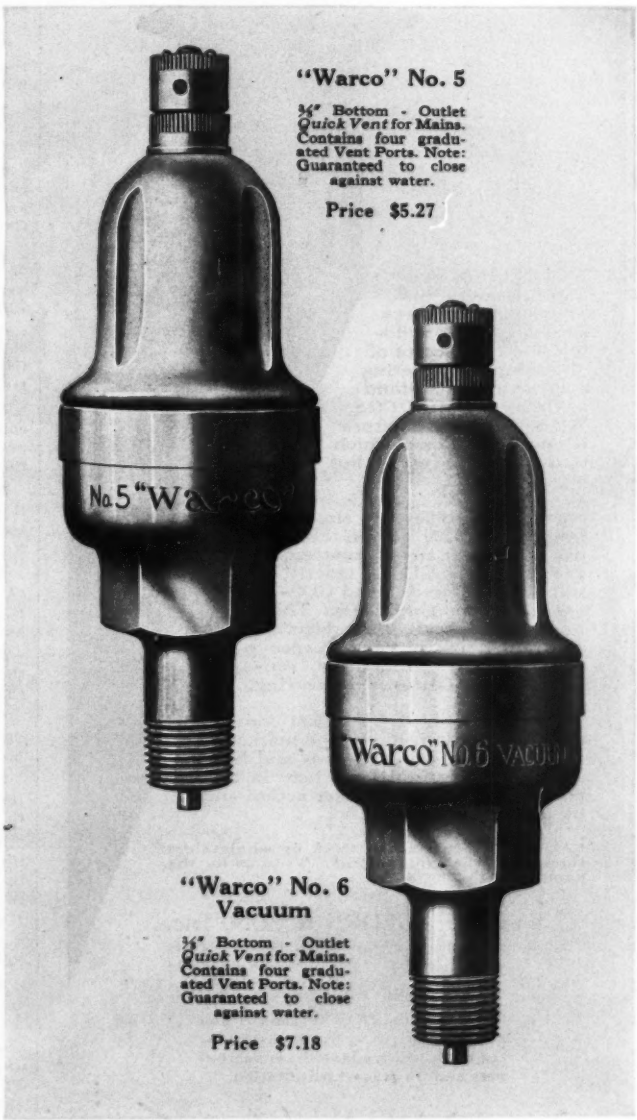
FORTY years ago this spring, W. A. Russell invented and developed the principle on which every volatile liquid Air Valve operates.

Today the "WARCO" line of Air and Vacuum Valves, perfected by W. A. Russell & Company, is the most efficient, the most complete and most trouble-free line of valves ever designed to make steam installations do better work.

Just as "WARCO" quality means greater satisfaction and the elimination of service expense, so do the liberal "WARCO" prices mean greater profits on sales.

Ask your wholesaler. If he cannot supply you, write us for name of one who carries "Warco" Valves in stock.

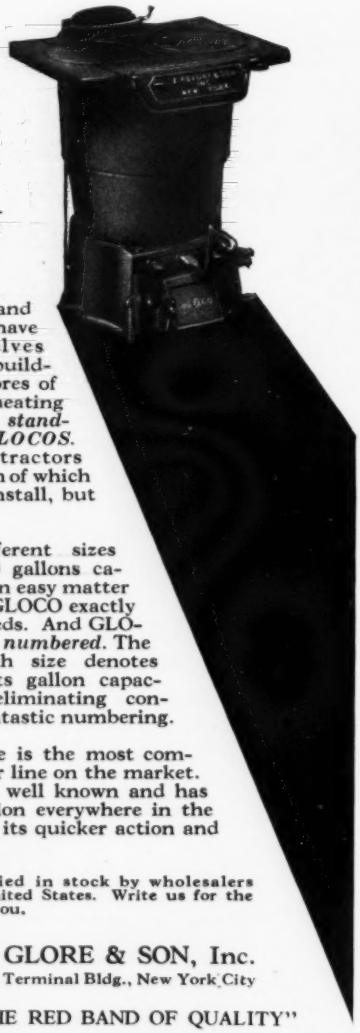
W. A. RUSSELL & COMPANY
Grand Central Terminal Bldg., New York City
Established 1890
Chicago Boston Pittsburgh Los Angeles


"Warco" No. 5
¾" Bottom - Outlet Quick Vent for Mains. Contains four graduated Vent Ports. Note: Guaranteed to close against water.
Price $5.27
No.5 "Warco"
"Warco" No. 6 Vacuum
¾" Bottom - Outlet Quick Vent for Mains. Contains four graduated Vent Ports. Note: Guaranteed to close against water.
Price $7.18

"Warco"
TRADE MARK REGISTERED

Automatic Air & Vacuum
Valves

IT'S SIMPLY A QUESTION OF WHICH GLOCO TO INSTALL



45 DIFFERENT SIZES

GLOCO Red Band Tank Heaters have proved themselves such a business-building line that scores of plumbing and heating contractors are *standardizing on GLOCOS.* With these contractors it's not a question of which tank heater to install, but which GLOCO.

Forty - five different sizes from 40 to 5200 gallons capacity, make it an easy matter to pick out the GLOCO exactly suited to the needs. And GLOCOS are *sensibly numbered.* The number of each size denotes approximately its gallon capacity — thereby eliminating confusion due to fantastic numbering.

The GLOCO line is the most complete tank heater line on the market. It is well made, well known and has attracted attention everywhere in the trade because of its quicker action and its *fuel saving.*

GLOCOS are carried in stock by wholesalers throughout the United States. Write us for the name of one near you.

EVINS F. GLORE & SON, Inc.
Grand Central Terminal Bldg., New York City

"LOOK FOR THE RED BAND OF QUALITY"

Every Genuine GLOCO Tank Heater is circled with a broad, distinctive red band, which adds to its attractiveness and its ready identification.

TRADE MARK
GLOCO
RED BAND TANK HEATERS

Montana Master Plumbers Association to be held at Boulder, with headquarters at the Boulder Springs hotel.

April 21 and 22, 1930.—COLORADO—The annual convention of the Colorado Society of Sanitary and Heating Engineers, to be held at Denver, with headquarters at the Hotel Albany.

April 22, 1930.—RHODE ISLAND—The annual convention and banquet of the Rhode Island State Association of Master Plumbers, to be held at Jim Smith's Inn, Warwick, R. I.

April 22 and 23, 1930.—MASSACHUSETTS—The annual convention of the Massachusetts State Association of Master Plumbers, to be held at Boston, with headquarters at the Statler hotel.

April 25 and 26, 1930—LOUISIANA-MISSISSIPPI—The annual convention of the Louisiana-Mississippi Association of Plumbing and Heating Dealers to be held at Shreveport, La., with headquarters at the Washington Hotel.

May 5 and 6, 1930.—FLORIDA—The ninth annual convention of the Florida Association of Master Plumbers and Heating Dealers, Inc., to be held at Bradenton, with headquarters at the Dixie Grande hotel.

May 5, 6 and 7, 1930.—N. P. S. A.—The annual convention of the National Pipe & Supplies Association, to be held at Pinehurst, N. C., with headquarters at the Carolina hotel.

May 9 and 10, 1930.—OREGON—The annual convention of the Oregon State Master Plumbers Association, to be held at Tillamook, with headquarters at the Tillamook hotel.

May 12 and 13, 1930.—GEORGIA—The thirty-eighth annual convention of the Georgia State Association of Master Plumbers, to be held in Atlanta, with headquarters at the Henry Grady hotel.

May 12 and 13, 1930.—OKLAHOMA—The annual convention of the Oklahoma State Association of Master Plumbers, to be held at Shawnee, with headquarters at the Hotel Hilton Phillips.

May 12, 13, 14, 15 and 16, 1930.—CALIFORNIA—The annual convention of the State Association of Master Plumbers of California, to be held at Sacramento. Convention headquarters will be at the Hotel Senator.

May 13 and 14, 1930.—CONNECTICUT—The fortieth annual convention of the Master Plumbers' Association of Connecticut, Inc., to be held at Hartford, with headquarters at the Bond hotel.

May 13 and 14, 1930—NEW JERSEY—The annual convention of the New Jersey State Association of Master Plumbers, to be held at the Woodrow Wilson hotel, New Brunswick, N. J.

May 19 and 20, 1930.—ALABAMA—The annual convention of the Alabama Master Plumbers Association, to be held at Birmingham, with headquarters at the Bankhead-Leland hotel.

May 19-20, 1930—TENNESSEE—The annual convention of the Associated Master Plumbers of Tennessee, to be held at Chattanooga, with headquarters at the Hotel Patten.

May 19, 20 and 21, 1930—PENNSYLVANIA—The annual convention of the Pennsylvania Master Plumbers' Association, to be held at the Bellevue-Stratford hotel, Philadelphia.

May 23 and 24, 1930.—WASHINGTON—The annual convention of the Washington State Master Plumbers' Association, to be held at Seattle.

May 26, 27 and 28, 1930.—KENTUCKY—The annual convention of the Kentucky State Association of Master Plumbers to be held at Crab Orchard, with headquarters at the Crab Orchard Spring hotel.

May 28 and 29, 1930.—NORTH CAROLINA—The twentieth annual convention of the North Carolina Association of Plumbing and Heating Contractors, to be held at Concord.

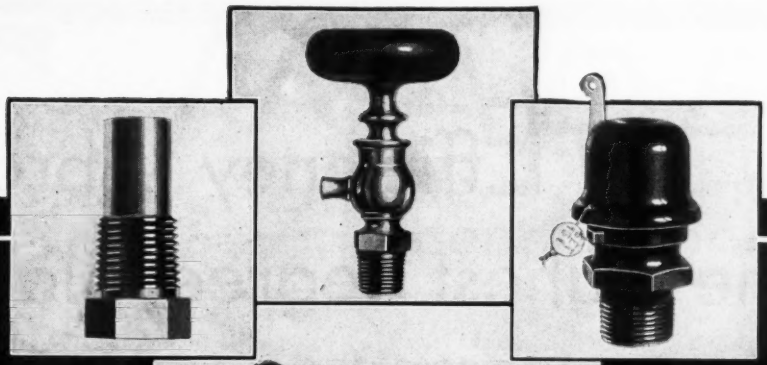
June 16, 17, 18 and 19, 1930.—H. P. C. N. A.—The annual convention of the Heating and Piping Contractors National Association, to be held in New York City.

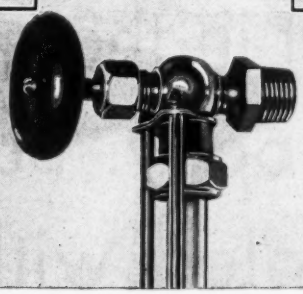
June 24, 25 and 26, 1930—N. A. M. P.—The forty-eighth annual convention of the National Association of Master Plumbers, at Boston, Mass. Sessions at Grand Hall of Mechanics Building. Headquarters at Statler Hotel.

COMING TRADE EVENTS

April 9, 10 and 11, 1930—The Midwest Bituminous Coal Conference, to be held at Purdue University, Lafayette, Ind., sponsored by the Engineering Extension Department of Purdue University, the Coal Trade Association of Indiana and the Illinois Coal Bureau, in collaboration with the Fuels Division of the American Society of Mechanical Engineers.

June 23-27, 1930—Exposition in connection with the annual convention of the National Association of Master Plumbers, in the Mechanics Building, Boston, Mass.



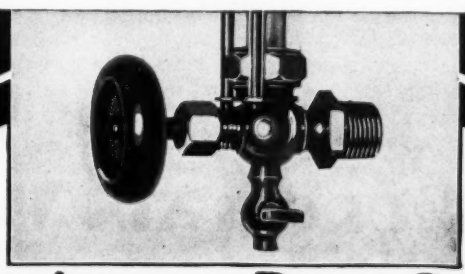


Capitol Brass Boiler Trimmings

In line with the modern trend to make the basement as good looking and as livable a place as possible, these Capitol Brass boiler trimmings are trim, neat appearing and of the best possible construction.

The pop valve has malleable iron base, considerably stronger than the usual cast iron. Brass seat is nicely ground, while the stamped case, also of great strength, is rust proofed and enameled, providing in all a very superior product. Fusible plug is made to Government standards. Water gauges and compression gauge cock are polished or rough as required and can have any kind of handles.

WRITE FOR PRICE QUOTATIONS



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CAPITOL BRASS DIVISION

MANUFACTURERS OF BRASS VALVES, BOILER TRIMMINGS AND PLUMBERS' BRASS GOODS

DETROIT~MICHIGAN

Efficiency . . . brought up to the highest degree, plays an important part in the manufacture of any commodity. But efficiency must be coupled with care and precision. In the two great Ford plants turning out 95,306 pieces of sanitary ware every year . . . care comes first and efficiency comes as a natural follower. . . .

FORDS PORCELAIN WORKS

PERTH AMBOY, NEW JERSEY

MANUFACTURERS OF SANITARY WARE

Kansas Masters to Convene at Salina

The Kansas Master Plumbers' Association will foregather at Salina on March 10 and 11 for its annual convention, with headquarters at the Hotel Clayton.

The officers of the Kansas association are Carl McGregor of Winfield, president; C. B. Hamilton, also of Winfield, vice president; A. T. Olson of Lawrence, treasurer; C. A. Bahruth of Arkansas City, secretary.

◆

Announce Dates for Massachusetts Convention

The Massachusetts State Association of Master Plumbers has selected April 22 and 23 as the dates for its annual convention, which is to be held at Boston. Headquarters will be at the Statler hotel. The officers of the Massachusetts state association are: Richard T. Thatcher of Fairhaven, president; James H. Trow of Salem, vice president; Wallace T. Wordell of Taunton, executive secretary; J. Preston Perham of West Roxbury, treasurer.

◆

Maine Convention Will Be Held in Portland

The Maine State Master Plumbers' Association will hold its annual convention in Portland on March 11 and 12 at the Falmouth hotel, according to J. E. Donovan of Winthrop, secretary of the Maine association.

Other officers of the association are N. M. Knudsen of Portland, president; Leon Blaisdell of Gardiner, vice president; and Frank A. Haseltine of Pittsfield, treasurer.

A Letter to Presidents of State Associations

By **GEORGE H. DRAKE, Acting President, N. A. M. P.**

My Dear President:

Since assuming the duties of Acting President of the National Association of Master Plumbers, I have received from state officers pledges of co-operation which I desire to acknowledge, also to thank you all for the many helpful suggestions that have been given.

The expressions of loyalty and generous offers of assistance to me in my new activities are sincerely appreciated and with such active, efficient, state officers, the responsibilities of the office will be somewhat lightened.

As we have already advised every state secretary, no changes will be made in the personnel of officers, directors and committees; and the National office will remain at 1321 Arch Street, Room 802, Philadelphia, Pa.

During the remainder of the present administration several important matters are to be considered for presentation to the national convention in June. A subject of great interest is that of federal trade practice rules. A committee has been appointed by this association to confer with a similar committee from the Heating and Piping Contractors National Association. Several meetings have been held and we expect some definite rules of procedure will be presented by this committee to the national convention. In connection with this question a statement which recently appeared in the "United States Daily" may be interesting:

"Trade practice rules calling for cessation of use of business methods not clearly illegal are often the most valuable.

"The first group of rules comprises those that cover practices which are clearly illegal. If any firm violates any one of these, it would be subject to an order to cease and desist from the practice. The commission's order would be supported by a court of appeals in case the firm refused to obey.

"In the second group are those rules which the commission does not certify as condemning illegal practices. They are accepted as 'expressions of the trade.'"

The committee appointed to study the authorized dealership plan has been meeting and is preparing a report to be submitted to your delegates at Boston.

Arrangements for transportation to the convention have been made with railroads for fare-and-one-half for the round trip and during this month railroad identification certificates will be mailed to state secretaries for distribution to the Associations in your state. As this convention promises to be the largest and most successful which has ever taken place, will you, as state president, urge every member to attend and to bring his family and friends?

If your state convention has not as yet been held, may I request you to co-operate with the national office by instructing your state secretary to answer the questionnaire which has been mailed to him so that we may be notified at once of the names of your newly elected officers? This is absolutely necessary so that correspondence from the national office may be addressed to the proper officials and in order to have our records corrected to date.

Looking forward to the pleasure of meeting you at Boston in June, I am

Very truly yours,

Geo. H. Drake,
Acting President.

New York H. & P. Contractors To Meet March 10 and 11

The Heating and Piping Contractors New York State Association will hold its thirty-fifth annual convention at Albany, N. Y., March 10 and 11 with headquarters at the Ten Eyck hotel. In predicting that this will be the best attended and most profitable convention ever held by the association, William J. Olvany of New York City, president, called attention to the fact that during the past year the membership of the organization had increased 30 per cent and that a number of new local associations have been formed. E. W. Tompkins, president of the Albany association, announces that the Capital District Association joins the New York state association in inviting every one interested in the heating industry to attend this meeting.

The program has been planned to give those in attendance a broad view of the present state of the industry and an opportunity of discussing ways and means of improving conditions in heating in the state. Walter Klie, president of the Heating and Piping Contractors National Association, will discuss the program of the national association. John H. Zink of Baltimore, Md., chairman of the national committee on welding and a member of the national board of directors, will talk on the use of welding in piping installations. M. E. Durkee, manager of the Certified Heating Bureau of the Heating and Piping Contractors New York City Association, will tell how a certified heating program can be inaugurated and operated.

The entertainment of the delegates and their guests will be in the hands of the Capital District Association and it is planning to see that no dull moments come to any one who visits Albany for this meeting.

◆

Large Meeting Held in Allentown, Pa.

In response to a letter sent out by J. Walter Singmaster, general manager of the Lehigh Valley Supply Co., Allentown, Pa., to master plumbers in that city, Lansdale, Scranton, and adjacent areas, approximately three hundred responded by attending a meeting on February 21 in the display rooms of the company. The letter called attention to forces that are battering at the foundations of the industry. It also called attention to the problem raised through those agencies selling fixtures and materials directly to the public without concern as to whether or not installations are made in compliance with sanitary laws. The letter, drawing attention to the economic business structure built through long years of effort and of apprenticeship, urged that the master plumbers attend the meeting for the purpose of shaping plans for the retention of the staple businesses which they have built.

The company has also been advertising in newspapers under the caption "Buy from Your Local Plumber," which is followed by "Look at These Fixtures, Compare Quality and Price with Anything You Have Seen or Heard of—Then You Will Surely Decide to Patronize the Man Who Is Your Neighbor—Who Has the Best Interests of Your City at Heart."

Among the speakers who addressed the meeting, besides Mr. Singmaster, were E. D. Swoyer, vice president of the Pennsylvania state association, and Howard S. Thrasher, business director of the Philadelphia Plumbing and Heating Development League. Both of the guest speakers emphasized the need for merchandising on the part of master plumbers and warned against permitting their services to the public being taken over by irresponsible agencies. Mr. Singmaster in his talk further expounded the plan of his company to merchandise materials and co-operate closely with master plumbers. A buffet supper was served at the conclusion of the meeting.

◆

Merchandise Group of Chicago Contractors Makes Progress

The members of the merchandising group of the Plumbing Contractors' Association of Chicago have been making steady progress since organization of the group several months ago. Since that time the number of plumbing establishments which have put in attractive showrooms has increased considerably. One of the chief aims of this group is to reclaim the sale of plumbing and heating material now being sold in hardware and department stores.

The merchandising and advertising committees are formulating plans and furnishing ideas which, it is hoped, will stimulate and increase sales for members. Regular meetings are held in the rooms of the association on the second and fourth Tuesday of each month.

How Blood Transfusions Prolonged Life of JOHN A. QUINN

A Letter from National Secretary Maney J. Feeney

To the Editor:—

As national secretary under the administration of one of the greatest presidents our National association has ever had in office, I feel it is my duty to say a few words at this time regarding his untimely death and the great loss sustained by our association. If I were to single out the men who from the birth of our organization have contributed to fostering and securing for us the best that could be procured for our craft, I can place the name of John A. Quinn in that class.

In his death, this association has lost not only a great leader, but one who has for many years made many sacrifices for our industry. His work as chairman of the apprenticeship committee in behalf of apprenticeship education stands out as a monument to his constructive and progressive ideas for the betterment of conditions existing in the plumbing industry.

His energy and courage in supporting every movement which he believed for the uplift of the organization will always be remembered, and his memory will be revered by every member of this association.

During the time our President was confined to his bed, it was necessary to have about twelve blood transfusions, and upon my return from the Presidents' and Secretaries' conference in Chicago, the family physician

called me on the phone and stated it would be absolutely necessary to have volunteers for further transfusions, as he found it difficult to find people with the type of blood required for these frequent transfusions. I informed him that a number of men could be at the hospital as soon as the physicians were ready to make blood tests, and was advised by him to have them there between 2 and 3 p. m. Friday afternoon, January 17.

Fourteen members of the Philadelphia Master Plumbers association responded and we met at the hospital at this hour. Every man gave up his business and came direct to the hospital and submitted to this blood test, but of the fourteen, only three were found to possess the required type of blood, and as an immediate transfusion was to be made, it was necessary to keep in communication with the hospital. Upon notification from the physicians of the men selected (although every man felt it would be an honor to give his blood for this noble cause) the three brothers, namely, George M. Hicks, Harold B. Asquith and John F. Donovan, executive secretary of the National association, immediately responded. A quart of blood was obtained from Asquith and Donovan, which I am sure prolonged the life of our President at least another week.

On January 24, the doctor called on Mr. Hicks and Mr. Asquith for another transfusion, but owing to the weakened and slowly sinking condition of the patient, as his life was slowly ebbing away, only the blood of one was used, namely, Mr. Hicks, who gave a pint of his blood.

We speak of fraternalism in many organizations of which we are members, but it has never been more fully exemplified and demonstrated than it was January 17 when these fourteen brothers responded to this call. If you can show me a truer spirit of fraternalism, I would like to hear about it. This, however, is no more than I would expect to receive from any member of our association.

It is not the intention of the undersigned to claim something for the Philadelphia Master Plumbers association as an individual organization. The thought in back of this story is to let everybody know the type of men composing our great organization and how proud we should all feel in holding membership in this wonderful National association.

The following brothers took the blood test: Harold B. Asquith, William H. Beahm, John F. Donovan, Frank S. Dykes, C. D. Eisemann, Maney J. Feeney, Henry M. Ford, George M. Hicks, Anton Jakoby, Fred J. Junkerman, Joseph M. McGinnis, Robert H. Pflug-Felder, James Soehle, and Harry L. Stilwell.

(Signed) Maney J. Feeney,
National Secretary,
National Association of Master Plumbers.

◆

Bridgeport Masters Hold Annual Dinner

The Bridgeport Master Plumbers' Association held its annual dinner at Champs farm, Tuesday, February 25, with the usual good attendance, and everyone had a delightful time. President William O'Dwyer was toastmaster at the dinner.

Among the speakers introduced by President O'Dwyer were two architects, Edward B. Caldwell, Jr., and Leonard Asheim; Edward Bray, a general contractor of

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Made of Refined Malleable Iron with Brass Seat Inserted in Place by Powerful Pressure So That It Cannot Become Detached.

Approved by Underwriters' Laboratories.

ILLINOIS MALLEABLE IRON CO.
Chicago, Ill.

Manufacturers Full Line Iron Pipe Fittings

OATEY FLASHINGS

A pure lead collar which gives the least resistance to proper caulking is one of the distinctive features of Oatey "4 in 1" Roof Flashings.

The collar is secured to the apron under pressure while hot, thus forming a joint that is impervious to the effects of water.

This method assures an "Always Dry" flashing that is good for the life of the roof.

Order Oatey "4 in 1" Roof Flashings from your jobber.

L. R. OATEY COMPANY
5500 Walworth Ave. - Cleveland, Ohio

Bridgeport; John Moore, president and secretary of the Associated General Contractors; B. Jos. O'Donnell, field secretary of the Fairfield County Master Plumbers' Association; John H. Walters, "Mayor of Nichols" and David Rowland, building inspector of Bridgeport. Afterwards, President O'Dwyer turned the meeting over to Herbert F. Stenstream, who was in charge of the entertainment.

The committee in charge of the event was as follows: Adolph G. Pitz, chairman, Herbert F. Stenstream, Albert Russell, Joseph F. Mongrain, Joseph Jacoby, Wilbur J. Wade, Howard F. Bryant and John Rourick.

◆

Rhode Island Will Hold Annual Banquet

The Rhode Island State Association of Master Plumbers has selected April 22 as the date for holding its yearly annual banquet. The affair is to be held at Smith's Inn, Warwick, R. I.

◆

Maine State Salesmen to Hold Dinner

The annual meeting and dinner of the Plumbing, Steam and Metal Salesmen's Association of Maine is to be held March 10 at Dunscroft Inn, Dunston, Me. This meeting, as is usually planned, precedes the Maine State Master Plumbers' Convention which is to be held March 11 and 12 at the Falmouth hotel, Portland.

◆

St. Paul H. & P. Contractors Organize

The Heating and Piping Contractors St. Paul Association was organized recently and the following officers elected: President, Clarence McGeary; vice president, Reuben L. Anderson; secretary, H. C. Nonnemacher; treasurer, W. B. Dahlby; executive manager, Victor L. Peavy. Mr. Peavy, who was formerly connected with the Plumbing and Heating Industries Bureau, conducts the business management of the organization from offices at 710 Minnesota building, St. Paul, Minn.

◆

Richmond Association Elects Officers

The Master Plumbers and Heating Association of Richmond, Va., installed its officers for 1930 at a meeting held February 10 in the executive offices of the organization. Harry G. Longworth was re-installed as president; H. B. Johnson, was made vice president, succeeding R. C. Beverley; C. G. Holyfield, re-installed as secretary-treasurer, and T. A. Talley succeeded R. M. Booth as sergeant at arms. E. G. Harris, H. A. Carter and W. G. Winter were installed as trustees. Brief reports of the past fiscal year were submitted by President Longworth and R. H. Griffin, association manager. The accounts for the organization were turned over to Messrs. Booth, Graham and Johnson, who compose the auditing committee.

◆

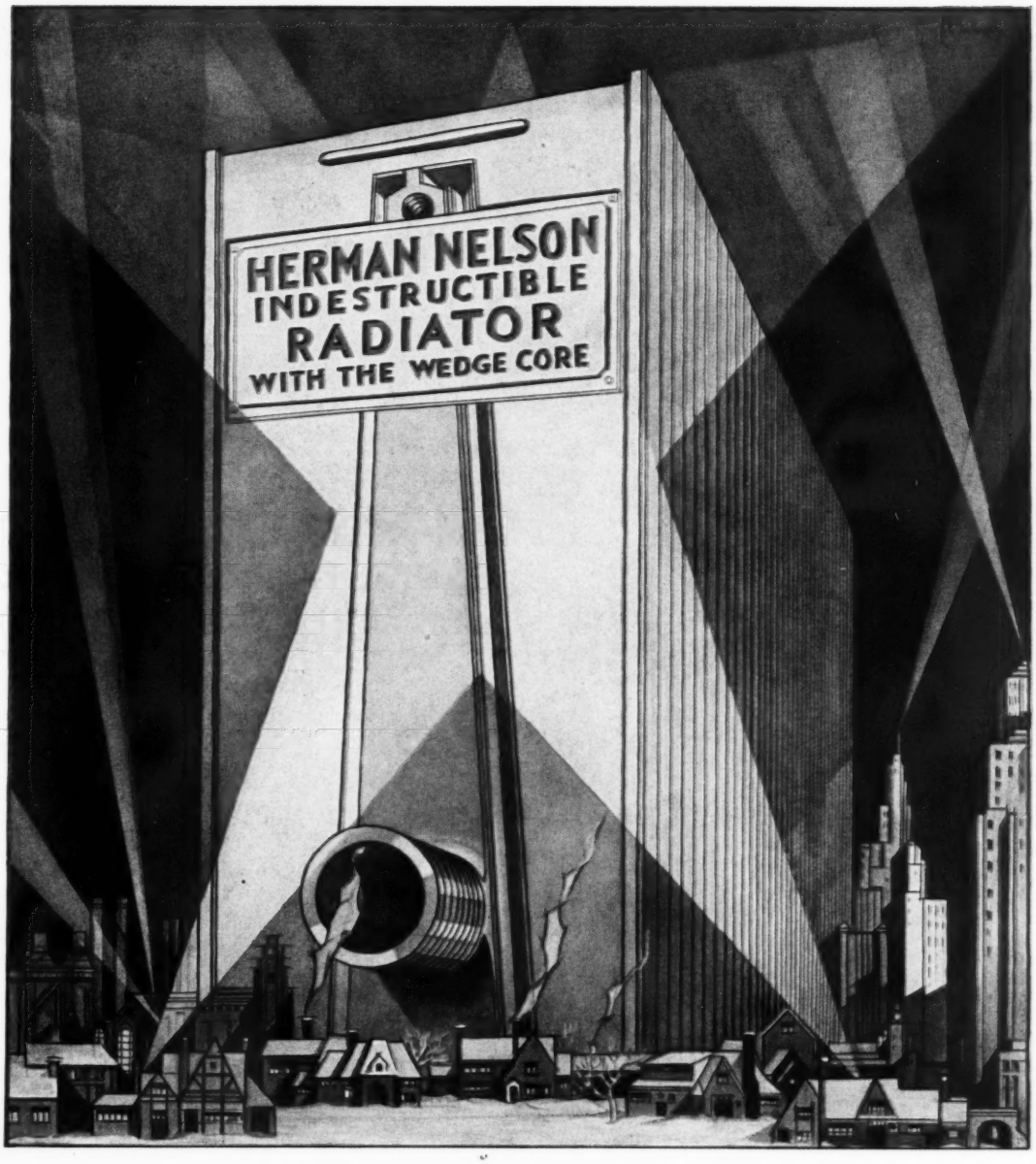
A. R. McGonegal Honored with Dinner

Honoring A. R. McGonegal, chief of the Plumbing Inspection Division, Washington, D. C., and president of the American Society of Sanitary Engineering, the members of the Master Plumbers' Association of the nation's capital tendered a testimonial dinner on February 20 at the Wardman Park hotel, which was attended by approximately 500 guests, some of whom came from distant parts of the country. Robert J. Barrett, former president of the Washington, D. C., association, was toastmaster, having been presented by its president, Frank A. Kerr who in a brief speech paid tribute to the guest of honor as a man who is looked up to as an authority on sanitation not only in the District of Columbia but in all sections of the country.

Speeches were read by Past National Director Francis C. Dorsey of Baltimore, Md.; Joseph J. Crotty, vice president of Central Foundry Co., New York City and past president of the American Society of Sanitary Engineering; Charles P. Moran, manager of the Washington branch of Crane Co. and president of the jobbers' association, also Allen W. Beam, president of the Maryland state association, in which each paid tribute to Mr. McGonegal, who has devoted the past thirty years of his life to guarding the health of the people of Washington.

W. C. Hanson of E. G. Schafer & Co., Washington, D. C., presented the guest of honor with a gold watch and chain, suitably inscribed, as a token from the members of the association to commemorate the occasion and as an indication of the high esteem and

Photo taken at the dinner given by the plumbing craft of Washington, D. C., to A. R. McGonegal



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The Herman Nelson Wedge Core Radiator is an exclusive feature of all Herman Nelson Heating and Ventilating Products and accounts for their satisfactory performance. ✣ ✣ ✣ ✣

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BEHIND THAT GRILLE IN THE WALL

A new trend in heating is opening up new opportunities for progressive heating contractors. Home builders and architects everywhere are swinging to the Herman Nelson Invisible Radiator.

They are choosing this light, compact radiator because it fits within the wall and occupies no room space; because it has no joints to leak and fail; because it offers *all* the advantages of ordinary radiators and none of the disadvantages.

The Herman Nelson Invisible Radiator comes enclosed in a scientifically designed steel case which fits in any standard wall or partition. For larger and taller buildings, a special removable panel is provided, permitting access to thermostatic traps and pipe connections. Self-closing doors give hand access to radiator control valves. Graduating damper affords instant control of heat output at grille.

You can count on a clean-cut, profitable job when you install Herman Nelson Invisible Radiators—a job free from complaints. Write for our engineering data book and full information.

There's a radiator that says..."This home is modern"

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HERMAN NELSON *Invisible* RADIATOR

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SYRACUSE
ALBANY
BUFFALO
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SCRANTON

HARRISBURG
PITTSBURGH
JOHNSTOWN, PA.
WASHINGTON, D. C.
CHARLOTTE, N. C.
GRAND RAPIDS
SAGINAW, MICH.
FLINT, MICH.
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LOUISVILLE
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CHICAGO
PEORIA, ILL.
DES MOINES
MILWAUKEE

GREEN BAY
MINNEAPOLIS
DULUTH
ST. LOUIS
BIRMINGHAM
ATLANTA
NEW ORLEANS
MEMPHIS
DALLAS

OMAHA
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KANSAS CITY
TULSA, OKLA.
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SALT LAKE CITY
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SPOKANE
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TORONTO
WINNIPEG, MAN.
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OSLO
MELBOURNE
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*Makers of the *Herman Nelson Invisible Radiator*, for residences, apartments, hotels, offices and monumental structures — the *Univent*, for the ventilation of schools, offices, churches and all buildings having an acute ventilating problem — the *Herman Nelson hi-Jet Heater*, for economical distribution of heat in factories, mills, garages, warehouses, and smaller buildings.

regard in which he is held by the master plumbers. Mr. McGonegal, in a few words, expressed himself as thrilled at the evidence of appreciation of his efforts which, he said, have always been toward the advancement of fair trade practice and proper business ethics. He also said that his endeavors would not have amounted to much if he had not always had the co-operation and support of the members of the association.

Baskets of flowers were presented by Mrs. W. E. Miller for the association to Mrs. McGonegal; Mrs. Kerr, and also to Mrs. H. A. Scroggins in appreciation of the work her husband had done as chairman of the arrangements committee. Flowers were sent to E. J. McGoldrick, who is confined to his home following an accident. A program of dancing, soprano, tenor and baritone solos by well known artists entertained the guests immediately after dinner. Later the evening was given over to dancing.

Among the guests in attendance were J. R. Lapham, dean of the College of Engineering, George Washington University; Norbert Melnick, plumbing inspector, Arlington, Va.; Otto Meinert, for twenty-two years plumbing inspector of Davenport, Ia.; A. H. Anadale, chief plumbing inspector of Washington Suburban Sanitary Commission; Samuel Tapp, assistant chief plumbing inspector, Washington; Col. John Oehmann, building inspector, Washington; C. A. McMunn of Clarksburg, W. Va.; George Fitch, chief plumbing inspector of Baltimore; S. E. Childs, president of Master Plumbers' Association of Arlington County, Va.; J. B. Gordon, sanitary engineer of Washington, and W. W. Morgan, president of the National Association of Plumbing and Heating Salesmen.

In the neighborhood of fifty-five telegrams and letters of regrets and congratulations were received. Among these were telegrams from James Smith, chief plumbing inspector of Winnipeg, Canada; T. M. Duggan, plumbing inspector of Houston, Tex.; William C. Groeniger of Columbus, O., chairman of the Hoover Code committee, and L. A. Cornelius, president, Wolverine Brass Works, Grand Rapids, Mich. The largest delegation present was that from Maryland, which numbered thirty-two, while another group of five was present from Virginia to extend congratulations to the honored guest.

Besides Mr. Scroggins, chairman, Thomas E. Clark, vice chairman, and Messrs. Moran, Tapp, Barrett, Kerr and McGoldrick, the committee responsible for the arrangements of the dinner dance were as follows: G. W. Skavish, D. H. Alsop, H. H. Brodie, J. M. Beane, Frank Bentley, King DeLawder, W. E. Clever, H. C. Eslin, G. R. Eberly, E. J. Ewing, H. R. Grinder, W. L. Gary, J. E. Heffron, F. W. Koehler, J. E. Leins, H. L. Lauder, Patsy Monaco, W. E. Miller, J. H. McCarthy, W. E. Owens, Arthur Snowden, and J. G. Schlosser.

Exhibitors at National Convention Are Announced

SPEAKING of the progress being made in plans for the June convention of the National Association of Master Plumbers, P. W. Donoghue, chairman of the convention and exposition committee, predicted that the Boston gathering will witness not only one of the greatest reunions of master plumbers and their families in the history of the association, but also one of the largest representations of plumbing, heating and allied products ever assembled in this country. The exposition prospectus was mailed to about five hundred manufacturers during the first few days of February, and within two weeks more than 50 per cent of the space was sold and under contract.

The national convention will be held on June 24, 25 and 26, in the Mechanics building, while convention headquarters will be at the Statler hotel.

The Boston exposition will have 178 booths, a larger number than customary in the past and for this reason the price per square foot is lower than usual. The exhibit hall is advantageously located, right next to the hall where the convention sessions and meetings of the special educational committee will be held. Not only will most of the firms participating in former national conventions be represented at the Boston exposition, but there will be many new exhibitors as well.

The members of the exhibits committee, working with Chairman Andrew F. Curtin, include: David Craig, William P. Kane, Jonas A. Laraway, C. J. Donoghue, H. A. Snow, H. L. Rose, Jr., and George F. Crawford.

The following list shows the firms that have already contracted for booth space at the coming national exposition:

	Booth Numbers
American Brass Co.	77 and 78
American Radiator Co.	71, 72, 85, 86, 98, 99, 112 and 113
American Tube Works	18
Bareham & Saunders	30
Benford Oil Burner Corp.	118
Bethlehem Steel Co.	17
Blake Specialty Co.	3
Blue Seal Chemical Co.	51
Boston Brass Co.	50
Boston Master Plumbers' Assn.	141
Wm. A. Bradford, Bradford Price Book	117
Burnham Boiler Corp.	53
A. M. Byers Co.	6
Carpenter & Paterson, Inc.	55
W. A. Case & Son Mfg. Co.	97
Central Foundry Co.	62, 63 and 64
Central Tube Co.	56
Chase Brass & Copper Co.	58 and 59
Chicago Faucet Co.	224
C. F. Church Mfg. Co.	34
Conover Company	46
Crane Company	73, 74, 75, 82, 83 and 84
Crest Manufacturing Co.	66
Crystal Oil Burner Corp.	209
A. F. Curtin Valve Co.	8
Decatur Pump Co.	13
Dezeo Company	7
Deming Co.	14
Domestic Engineering	32
Duriron Co., Inc.	1
EverHot Heater Sales Co.	29
Excelso Products Corp.	76
Fiat Metal Mfg. Co.	138
Stanley G. Flagg & Co., Inc.	68 and 69
Holyoke Heater Co.	93
Imperial Brass Mfg. Co.	114
Johns-Manville Corp.	2
Josam Mfg. Co.	107 and 108
John G. Kelly, Inc.	40
Kohler Company	38, 39, 48 and 49
Robert A. LaCentra	94
Minneapolis-Honeywell Regulator Co.	35
Mueller Company	116
Mueller Brass Co.	12
Nash Engineering Company	60 and 61
National-Boston Lead Co.	5
National Tube Co.	15 and 16
Nye Tool & Machine Works	70
Oster Mfg. Co.	95 and 96
Plumbers Trade Journal Pub. Co.	54
Radiator Specialty Co.	4
Rawlplug Company, Inc.	137
Reading Iron Co.	115
Reliable Automatic Sprinkler Co.	222
Ridge Tool Company	132 and 133
Riverside Boiler Works	47
Ruud Mfg. Co.	67
J. A. Sexauer Mfg. Co., Inc.	33
Sloan Valve Co.	119
H. B. Smith Co.	26
Smith & Wesson	109
Speakman Company	89 and 90
The Stack Heater Company	65
Standard Sanitary Mfg. Co.	100, 101, 110 and 111
B. F. Sturtevant Co., Inc.	81
Taco Heaters Co., Inc.	57
Toledo Pipe Threading Machine Co.	139 and 140
Trenton Potteries Co.	87 and 88
The Vinco Company, Inc.	91 and 92
Walworth Company	79 and 80
Weil-McLain Co.	44 and 45
Wolverine Brass Works	102 and 103
Woodward-Wanger Co.	104 and 105
"X" Laboratories	52
Youngstown Sheet & Tube Co.	106

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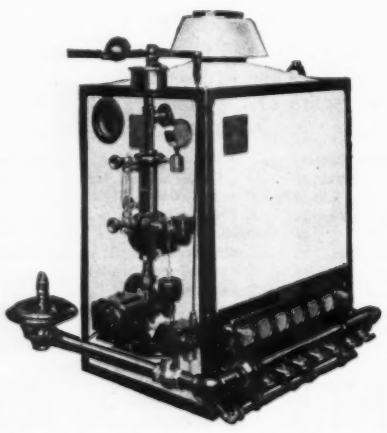

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Philadelphia is Convention City for Pennsylvania Association

The Pennsylvania State Association of Master Plumbers and the Master Plumbers' Association of Philadelphia are rapidly completing arrangements for the thirty-sixth annual state convention, to be held at the Bellevue Stratford hotel, Philadelphia, on May 19, 20 and 21.

George F. Uber, who is general chairman of the committee of arrangements, says: "This will be the best state convention ever held." Mr. Uber has selected the following members as chairmen of the various committees: Maney J. Feeney, convention chairman; Harold Asquith, program; Harry L. Stilwell, educational; John F. Seibel, automobiles; William J. Beahm, decorations; Harry L. Stilwell, exhibition committee; George M. Hicks, entertainment; William Boal, hotel; D. F. Durkin, Jr., reception; Martin Moran, printing; Robert H. Pflug-Felder, publicity; Walter Raid, registration; Frank Dykes, transportation; Duncan A. Worrell, music; E. Herman Moser, dancing.

George F. Uber

The keynote of the convention will be educational, and to this end the Philadelphia association is directing its efforts to present a program of real merit. Sales demonstrations, sales ideas, business getting and sales technique will be featured during the educational hours.

An interesting exhibit of plumbing and heating equipment is being planned and will be conveniently located. The exhibition, which will be in the roof garden of the hotel, will be open to the public. For the benefit of the exhibitors, water, gas and steam lines will be available on the exposition floor.

The Ladies' Auxiliary of the association, assisted by George M. Hicks, chairman of the entertainment committee, is devoting much time and thought to preparing an entertainment program that will send those attending away with pleasant recollections of the 1930 convention. The various committees of the Pennsylvania state convention, meeting February 10 at McCallisters, in Philadelphia, with general chairman George F. Uber presiding, outlined plans that are intended to insure the convention being a thoroughly successful one.

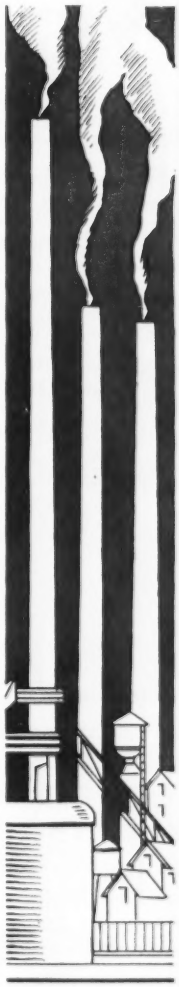
Maney J. Feeney

Mrs. George M. Hicks, president of the Women's Auxiliary of the Philadelphia Association of Master Plumbers, reported that her various committees are actively engaged in arranging a program of entertainment for the visiting women, funds for financing which have already been accumulated.

Harry L. Stilwell, chairman of the committee in charge

EXPERIENCE

KNOWS THE FACTS



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of booths and the educational program, advised that there are forty-six spaces available for exhibiting purposes. He also indicated that the educational program preparations are going forward satisfactorily.

Robert H. Pflug-Felder, secretary of the association and chairman of the publicity committee, displayed numerous letterheads, banners, stickers, etc., which are to be used for advertising purposes and said he feels certain that together with the help of trade papers widespread publicity will be given the convention.

Harold Asquith, chairman of the program committee, reported that an intensely interesting meeting is being planned. George M. Hicks, chairman of the entertainment committee, indicated that the work of his group is nearing completion and said that suggestions from members would be welcome.

Walter Raid, chairman of the registration committee, asked that the names of all delegates be forwarded. Frank S. Dykes, heading the committee on transportation, has arranged for busses and automobiles for use during the convention, while John F. Seibel outlined the plans of his committee. Martin J. Morgan, chairman of the committee in charge of printing, said that his group is ready to undertake its job.

◆

Indiana Prepares for Annual Convention

The Indiana Society of Sanitary Engineers will hold its thirty-fourth annual convention at Fort Wayne, March 10, 11, 12 and 13. The first three days are to be devoted to business sessions and the fourth day of the meeting has been set aside for the purpose of sightseeing.

A special feature of the opening session will be the introduction of the members of the Quarter Century club, composed of representatives of those firms which have had twenty-five years or more of continuous membership in the state organization. Registration for the convention will open the morning of March 10 at the Anthony hotel, which is to serve as headquarters. The board of directors will meet that morning. State President Arthur Lahr of Lafayette will make his annual report at the Tuesday session. W. H. Burke of South Bend is state vice president, and Earl Cass of Lafayette is secretary-treasurer of the Indiana state association.

Arthur Lahr

The Fort Wayne convention committee has made elaborate plans for the entertainment of the visitors and a splendid business program has been prepared. The Fort Wayne local officers are Arthur Ehrman, president, Lou Gollmer, vice president and Marion Connett, treasurer.

The annual bowling tournament, under the supervision of G. T. Watson, executive secretary of the Indianapolis association, will be held after the close of the business session on Wednesday afternoon. A large number of teams have entered the contest.

Missouri Convention Date Approaches

The officers of the Missouri State Association of Master Plumbers, seeking to encourage and assure a good attendance at the coming state convention, have been sending out letters to all association members, reminding them of the approaching event and enclosing a reprint from DOMESTIC ENGINEERING of the article, "Why Annual Conventions," by the late John A. Quinn, president of the national association.

W. R. Dunlap

The Missouri convention will be held on March 17 and 18, in St. Louis, with headquarters at the Statler hotel. W. R. Dunlap and J. S. Levene, both of Kansas City, Mo., are president and secretary, respectively, of the Missouri state association.

◆

Texas Convention to be Held at Abilene

The Associated Master Plumbers of Texas, according to a recent announcement from O. W. Ribble of Lubbock, state secretary, will hold their annual convention at Abilene, April 14, 15 and 16. The Hilton hotel has been selected as convention headquarters. The other officers of the association are: Roche Newton of Lubbock, president; George W. Winburne, Jr., of Wichita Falls, vice president; N. S. Hill of Waco, state treasurer.

◆

Kentucky Sets Convention Date

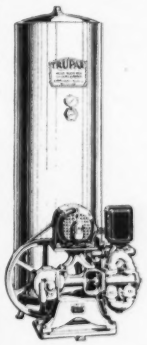
The annual convention of the Kentucky State Association of Master Plumbers will be held at Crab Orchard, on May 26, 27 and 28, according to a recent announcement from F. H. Tice of Lexington, president of the association. Headquarters will be at the Crab Orchard Spring hotel. Crab Orchard is a summer resort and the hotel is well-equipped for convention purposes. Golf, tennis, swimming, fishing, boating and horse back riding are among the available entertainment features. The state officers and the committee in charge of arrangements for the meeting are already busy working out plans.

◆

Chattanooga to Receive Tennessee Convention

The Associated Master Plumbers of Tennessee will meet in one of the most historic cities of the South when they foregather in Chattanooga for their thirty-second annual convention, which will be held on May 19 and 20.

Tennessee master plumbers are being urged not to miss the opportunity of coming to Chattanooga in May and availing themselves of the pleasures and educational advantages of the convention and the city at the same time. Arrangements are being made for abundant entertainment features as well as a profitable business program. Many delegates will welcome the chance of viewing at first hand the numerous historical points of interest in and about Chattanooga.



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If you aren't using them, you ought to try them on that next job. You'll agree with the others that they're *good*.

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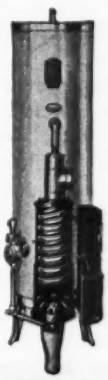

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HEATERS

Group picture taken at the annual short course held at Massachusetts Institute of Technology

Plumbing and Heating Fundamentals Studied at M. I. T. Short Course

ON February 18 and 19, at Cambridge, Mass., the Massachusetts Institute of Technology held its fourth annual conference or short course for the members of the Massachusetts State Association of Master Plumbers and Massachusetts Sanitary Club.

As in three previous years, the conference was very much of a success, and it is not to be wondered at, for it is conducted along most excellent lines. In the first place, M. I. T., one of the outstanding engineering institutions of the country, has a wealth of material in its own faculty for use in conducting such a conference.

These short courses are for the purpose of providing the plumbing trade with knowledge that does not readily come to them through the contacts that they generally make. It is technical knowledge that they greatly need—knowledge of the fundamentals that underlie the almost infinite number of actions and operations that enter into the field of plumbing and heating. And where could such knowledge be sought so successfully as through this engineering institution?

In conversation with a young plumbing contractor, we were pleased to hear him say that he felt the knowledge accumulated from the four short courses already held was invaluable. He had carefully written up his notes after each conference, and was in the habit of frequently referring to them for information. Such results are greatly encouraging.

Leadership in Short Course

Professor Tyler had been the leading light of the three previous conferences, but during the past year he had severed his connection with M. I. T. to accept the office of Dean of Engineering at the University of Washington, at Seattle, Wash. It seemed strange that Professor Tyler should not preside at the conference, and his absence was greatly felt. Nevertheless, Prof. Thomas R. Camp, who has now assumed the leadership of these conferences, is taking hold earnestly and whole-heartedly, and the success of the 1930 meetings was largely due to his efforts.

At the opening session, Professor Camp introduced Dr. Samuel Wesley Stratton, president of Massachusetts Institute of Technology, who stated that while it was a pleasure to again welcome the conference, after four years they should know that they are always welcome.

Dr. Stratton stressed the fact that the laboratory man must of necessity look to the practical man to help him out. He pointed out that modern research was being carried out in just that way—by combining the technical and the practical.

In his response for the State Association of Master Plumbers, Pres. Richard T. Thatcher expressed the association's continued gratitude to the Institute. He made a pleasing allusion to Professor Tyler, and offered to Professor Camp the same co-operation his predecessor had received.

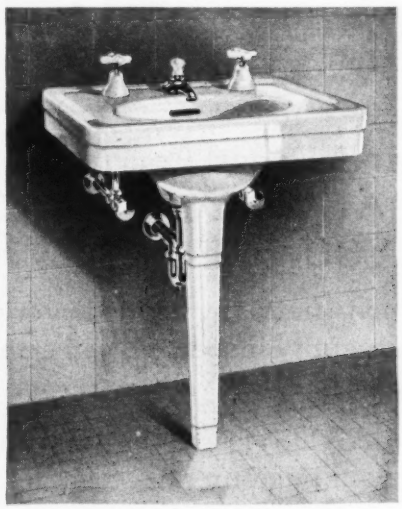
Talk on Plumbing Inspection

The first formal address was by Prof. Edward F. Miller, who has appeared on each of the preceding conference programs. His subject was "Relations between Municipal Plumbing Inspectors and the State Board of Examiners."

It should be stated that Professor Miller is a member of the Massachusetts State Board of Plumbing Examiners. He opened his address by stating that the field

1855 · SEVENTY-FIFTH ANNIVERSARY · 1930

One million homes to modernize Crane Co. can help you get your share



One of the favorites among home owners who are modernizing is this Ipswich *lavatory, C 598 M1. In addition to being unusually handsome in appearance, it has all the modern mechanical refinements that can be demonstrated so convincingly in a sales talk*

"One million homes will be modernized this year," states Julius H. Barnes, chairman of the U. S. Chamber of Commerce. Commencing this month, the bulk of business will be transacted by midsummer. If you want to share in it, get ready now.

A good way to start is by taking inventory of yourself and your stock. Do you know all the latest developments in plumbing? If you don't, you might drop into the nearest Crane branch. Any one of the men placed there to serve you, will be glad to talk things over with you.

Do you know how to get prospects for modernizing? Crane Co. has experimented lately with different methods of securing prospects. The results are interesting, and they are yours for the asking.

How is your stock? The experience of contractors proves that it is well to dress up exhibit rooms with some fixtures that attractively display modern improvements. But if you haven't a show room, remember, the Crane Exhibit Rooms were built to serve you.

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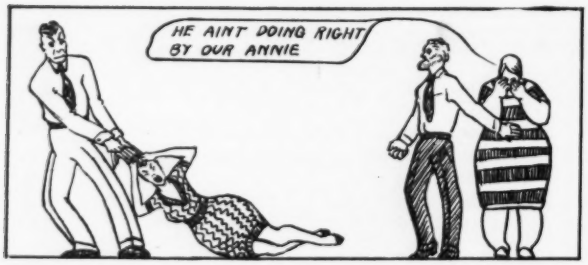

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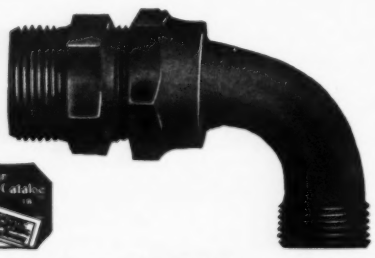

If you are interested in seeing how brass goods should be made and if you're down Trenton way some time, come in and see how Trenton does it.

You'll agree with us, then, that when you want brass goods of any description, the correct thing to do is to say, "Trenton" to your jobber.

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man now employed by the state board was doing much to bring closer contact between plumbing inspectors and the state board, this being shown by the fact that during his comparatively short service, three communities had already adopted plumbing regulations, three others had adopted the state plumbing regulations, and 27 communities were on the point of adopting them.

There is now before the Massachusetts state legislature a bill providing for the regulation of plumbing in the smaller communities, which is badly needed.

One of the items of this bill requires that all appointments of plumbing inspectors throughout the state must have the approval of the state board.

Plumbing Research at M. I. T.

The first session was concluded with an address by Professor Camp on "Progress in Plumbing Research at the Massachusetts Institute of Technology." This address gives much hope for future conferences, as we shall see.

Professor Camp briefly sketched the plumbing research of recent years, making special mention of the work done at the United States Bureau of Standards at Washington, and at the University of Illinois. He called special attention to the fact that Dr. Stratton, president of M. I. T., was at the head of the Bureau of Standards when that work was undertaken.

Professor Camp in a recent interview with Dr. Hunter, who had directed this work, had learned of the continuation of the work, which had first been confined to plumbing for dwellings, and now was investigating the problems involved in the plumbing for tall buildings.

It was pointed out that most of this work as well as that at the University of Illinois, relates to soil waste and vent lines.

To Investigate Water Closets

Reference was made to Illinois bulletins Nos. 143 and 178 as being very helpful, following which an article entitled "Eight Years of Plumbing Progress" was read, this being a sort of resume of the accomplishments to date of the Hoover sub-committee.

With the Hoover and Illinois work defined, Professor Camp came to the real purpose of his address. He stated that Massachusetts Institute of Technology proposes an investigation along quite different lines. They propose to take the water closet and its associated devices as the field for their research efforts. In their study of this fixture, they plan, in the first place, to study the design of the water closet, for the purpose of correcting the present extravagant use of water that is to be charged against this fixture. This work also involves the study of flushing devices and of the horizontal connections for water closet wastes.

The purpose back of this investigation is well considered, for it is primarily to assist in the cutting down of the consumption of public water supplies.

In England only about three gallons of water are consumed in the proper flushing of a water closet, whereas in this country it is seldom as low as that, but generally close to five gallons. This statement was made with the qualification that there is a wide range between different makes of water closet bowls in the consumption of water. If the flushing of water closets can be done in this country on three gallons of water, it is estimated that

thereby the consumption of public water supplies would be reduced by fully 10 per cent. Furthermore, it is believed possible to reduce the amount to a volume even less than three gallons.

In addition to cutting down volume, it is also hoped that the rate of supply may likewise be reduced. This would mean that smaller sizes of pipe could be used, and for large buildings especially, this would effect a great saving.

Left to right—back row: W. P. Bailey, Jr., Mark Greenleaf, J. C. Clement. Front row: Walter P. Bailey, Sr., Richard Thatcher, president of Massachusetts State Association of Master Plumbers, all of New Bedford, Mass.; E. N. Coggeshall, Acoaxet, Mass. Photo taken at recent conference at Massachusetts Institute of Technology

It will be seen then that the program outlined by Professor Camp, as was the Hoover investigation and experimentation, is based on public welfare.

The encouraging announcement was made that a laboratory has already been set aside by M. I. T. for this purpose.

Professor Camp stated that this program is a large order, and that to carry it out successfully requires the co-operation of the plumbing trade and manufacturers.

Research Sponsored by Individual Contribution

From state association officials it was learned that in order to carry out the M. I. T. research program for the first year, there would have to be raised several thousand dollars, and that it was fully expected that an ample amount would be obtained from individual members of the state association.

The next speaker was Prof. Charles M. Spofford, head of the department of civil and sanitary engineering, under whose auspices the conferences are held.

The purpose of this talk was to outline a course that is under consideration at M. I. T.

The lecturer pointed out that the popular thought of civil engineering, that it pertains to surveying only, falls far short of the truth. In reality the subject concerns the building of highways, bridges, railroads, airports, etc., also water supply projects, sewage projects, housing projects, in fact all problems of construction. Sanitary engineering, which is a department of civil engineering, handles those engineering problems which affect the public health.

For the M. I. T. sanitary engineering course there is now under consideration an option covering courses in plumbing, heating and ventilation, equipment, refrigeration and other subjects. Such a course would also include biology, bacteriology, water analysis, etc.

It would not be the idea to teach a trade, but to provide the underlying fundamentals. The entrance re-

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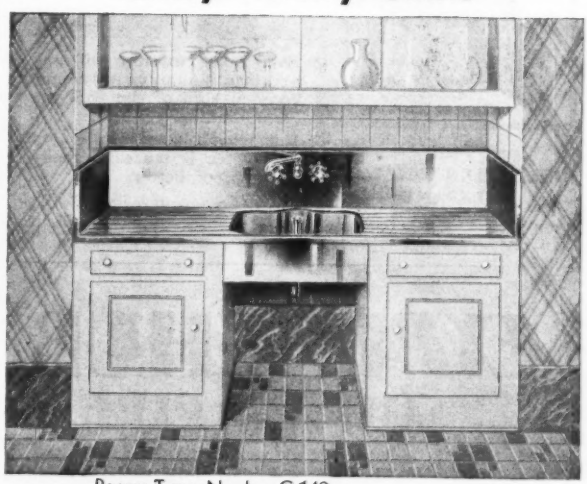

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quirements and graduation requirements would be of the same high standard as for other engineering courses, with the degree of B. S. in civil engineering.

This 15 minute talk was of value in that it showed that educators are recognizing more and more, the need of more advanced education for those who are to take leading parts in the plumbing and heating trades of the future, and that they are getting ready to meet this demand.

Prof. H. W. Hayward had the next place on the program, his subject being "Problems in Mechanics Which Are of Interest to the Plumber." As the speaker explained, while the subject did not actually come into the plumbing contractor's line of work directly, a knowledge of the fundamentals should be beneficial. He then interpreted a number of important terms in mechanics, such as center of gravity, moment of inertia, modulus of elasticity, stresses, strains, etc. He made direct application of some of these terms, particularly those which involve the safe and unsafe cutting of timbers, etc.

Expansion and Condensation

"Steam and Hot Water Piping" by Prof. James Holt was the next lecture. Prof. Holt has been heard at each of the four M. I. T. conferences, and he is always attentively listened to. This lecture concerned chiefly the two subjects of expansion and condensation in heating systems, and showed their co-relation.

An amount of expansion 1½ in. per 100 ft. of pipe was named as a safe amount of expansion to allow, and that this allowance is the one commonly made.

Professor Holt gave the following table of coefficients of expansion for the common pipe materials:

Drawn brass	.0000105 ft. per foot per 1 degree
Copper	.0000095 ft. per foot per 1 degree
Wrought iron	.0000068 ft. per foot per 1 degree
Steel	.0000067 ft. per foot per 1 degree
Cast iron	.0000065 ft. per foot per 1 degree

The common methods of allowing for expansion are 1—by turning in the joints, 2—by the use of expansion joints, and 3—by the use of expansion bends and loops. Expansion and drainage of heating pipes have a close relation, one to the other.

Condensation should drain in the direction of flow, and pitch should generally be not less than 1 inch per 10 ft. If condensation drainage is opposite to flow, larger pipe must be used.

It is an easy matter to give pitch to pipes when installing them, but when this allowance is not sufficiently great, expansion of risers may actually produce a reverse pitch, thereby forming water pockets, with resultant difficulties.

Down risers should be firmly anchored near the top, so that expansion will be forced downward. When this result is attained, branches to radiators will often have more pitch when the riser expands than when there is no expansion. Such a riser should have an expansion joint lower down.

Too short radiator connections should be avoided, as they provide for no expansion.

The settling of buildings, especially high buildings, will often produce reverse pitch.

Another difficulty which was discussed was the common lack of flexible connections off heating boilers.

Following his talk, Professor Holt showed a number

Spring Heating Season

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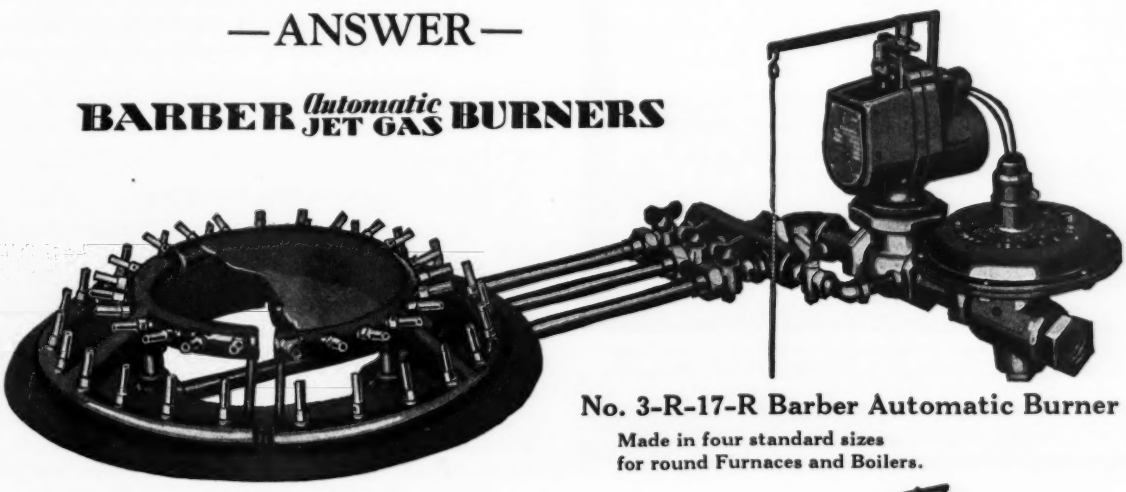

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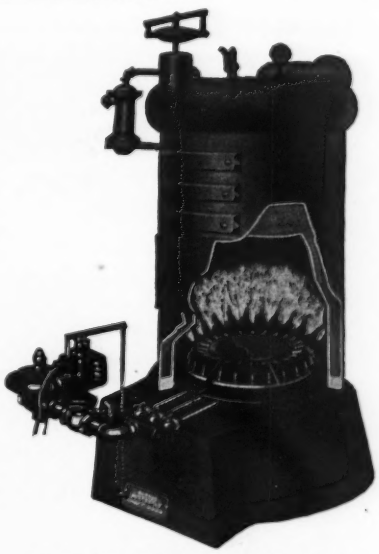

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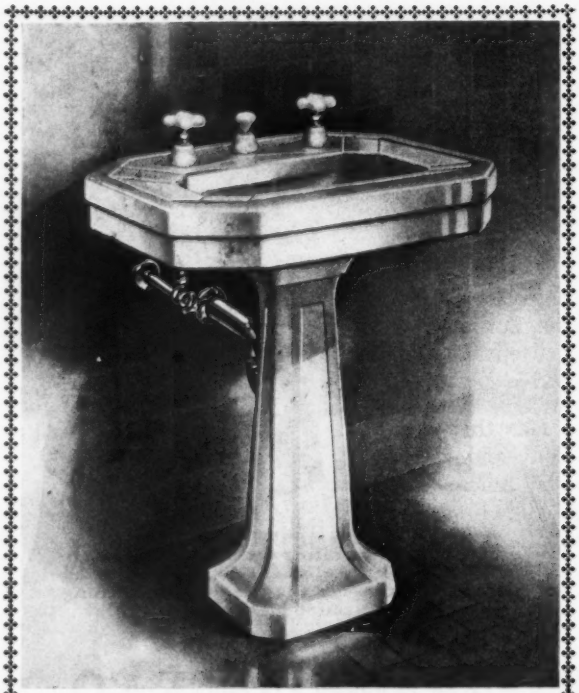

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of lantern slides, following which, he conducted the members of the conference through the extensive plant of the Massachusetts Institute of Technology, showing and explaining the features of the heating system.

Trip Through Refrigeration Laboratories

While one-half the members were under Professor Holt's leadership, the other half were conducted to the refrigeration laboratories by Professor Camp, where demonstrations of refrigerating problems were being conducted by Professor W. H. Jones. Later, the two divisions were exchanged.

A special evening session was held for members and ladies, at which Mr. Henry M. Lane, instructor in electrical engineering, gave a most interesting and instructive lecture and demonstration on the subject of television.

The second day's sessions were in charge of Mr. James G. Gillespie, president of the Massachusetts Sanitary Club.

Talk on Merchandising

The opening lecture was by Robert F. Elder, instructor in economics and statistics, on the interesting subject, "Current Developments in Merchandising."

Mr. Elder in opening his talk, pointed to the fact that to many the meaning of merchandising is the selling of an article to a man who doesn't need and doesn't want it for more money than he ought to pay for it. The real meaning of merchandising is efficient service and high quality in whatever is sold to the customer.

In times past, as a general thing it has been the producer who has held the commanding position, but now, when there is a surplus of production in so many lines, the consumer rules the situation. Therefore the choice which the consumer makes between different producers means the success or failure of each individual producer. How to sell thus becomes the great question which is at issue.

The plumber must know his market. He should have full knowledge of the number of homes in his territory, the number of those able to buy, of those willing to buy, the number of competitors, the amount of business possible and available, and his reasonable share of that business.

In addition to the two fields of repair work and new work that he naturally shares in, there is a third field for the plumber provided in the modernizing of old buildings.

Possibilities in Remodeling

A national survey shows a market in the modernizing of old buildings, of at least twenty billions of dollars. An intensive study of this subject should certainly be made by the plumbing contractor. This should include an analysis of income, habits, desires, etc., of the plumber's market. Knowing the market, then he should set for himself a standard to be reached.

In the repair work and in the modernizing campaign, just sending a man to do the work, and then sending a bill for the work is not enough.

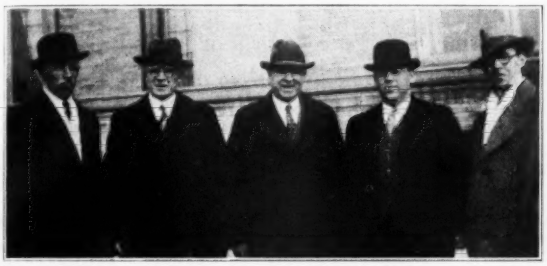
The plumber should not be satisfied with merely rendering service when it is asked of him, but the plumber should make it his business to show his prospects the need

that actually exists in their homes for more and better plumbing.

The prospect is going to spend his money in some direction or other, and it is the plumber's duty to bring his wares to the prospect's attention in order to get his share of the money that the prospect will surely spend.

Such a policy as this should not be considered as a plan to sell the prospect something he doesn't want—that would be a basis that would not deserve to succeed.

There is a new doctrine that the plumber should know about—the doctrine of "Progressive Obsolescence." The same train of thought that causes a man to turn in his automobile every year or so, should be made to apply to the home—to the plumbing in the home. Many people would be willing to apply this doctrine to their homes, if some pressure was brought to bear upon them. Left to themselves however, such a doctrine would probably never be put into force.



Left to right—Jean Harnois, John Ryan, and John B. Feehan, all of Lynn; Martin W. Duggan, Newburyport, Mass.; F. Crotty, Lynn. Photo taken at recent conference at Massachusetts Institute of Technology

It will be clear then, that for the plumber there is more danger from the competition of other lines than from the neighboring plumber. Competition is no longer the meeting of a competitor's price, but of getting one's share of the business that is to be obtained.

Co-operation in the plumbing trade is a good thing for meeting these conditions.

In closing a most instructive address, Mr. Elder stressed the point that success in business today means more than hard work; it means the acquiring of knowledge, knowledge not only of business, but of markets, of costs, of possibilities, of what is going on, in fact success in business today requires vision.

Refrigeration Subject of Interest

"Preservation of Food Under Domestic Refrigeration" was the subject of the next lecture, given by Professor Samuel C. Prescott, head of the department of biology and public health, a speaker who had been heard at each of the preceding conferences. The address was based on recent research work undertaken at M. I. T. It was pointed out that the length of time in which foods may be kept depends principally on two things, temperature and the cleanliness used in the production and handling of the food.

Spoilage and Bacteria

Organisms causing spoilage are of two types, aerobic and anaerobic. Aerobic bacteria, depending upon a supply of oxygen, produce moulds and fungi. Anaerobic bacteria, which do not require air, originate in the interior of foods. The aerobic bacteria are handled by ex-

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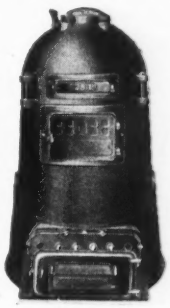

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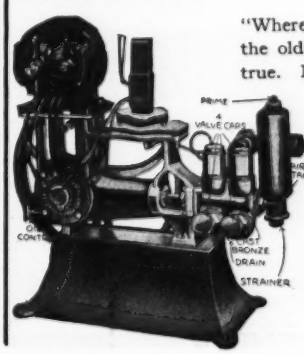

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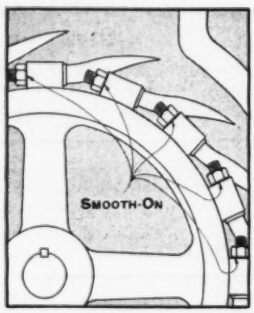
"It seems that the ice-crusher in the sausage department was shedding its teeth"



A North Carolina packer came to his Engineer's home one evening, asked the Chief to bring his radio set to the plant and stay there so as to be present when certain night troubles developed. The Chief sized up the job as indicated in the headline.

Crusher teeth were occasionally dropping into the crushed ice, passing on to a cutter and then into a mixer. Each time, the cutter and mixer were wrecked and the department had to be shut down.

The crusher was a simple thing—merely a hopper and revolving drum with teeth bolted onto the face at regular distances—but the nuts that held the teeth would not stay on. Lock washers? They too were chewed up and thrown into the ice. Set screws on the nuts? They rattled loose and choked the cutter. The nuts were pulled up tight, marked, and then the bolts were drilled and cotter pins put on. The cotters worked loose, and the teeth turned sideways and broke loose as before.

Then the Chief took to Smooth-On No. 1. He set all the teeth in a bed of Smooth-On No. 1, put more on the bolt threads and pulled the nuts up tight.

That ends the story, for there were no more interruptions. A year later all the teeth were still there. The Chief says any one is welcome to come and count them, as he did to check up before writing us his experience.

This Engineer also says that the Smooth-On No. 1 he has purchased in 25 years has proven worth its weight in paper dollar bills.

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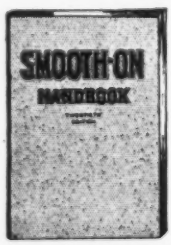

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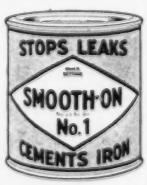

cluding air, and the anaerobic bacteria by supplying air.

Stagnant air is to be avoided. Humidity is an important feature in food preservation, and is a strong factor in spoilage.

Each food has its own type of bacteria. It is impossible to keep food germ proof.

There are numerous types of bacteria on the surface of foods, and some of these come from handling.

Processes of decay resulting from bacterial action, are kept in check by refrigeration.

Fifty degrees is the minimum temperature at which refrigerators are kept, and the average temperature is from 55 to 60 degrees.

The point was brought out in discussion, that moulds on food do not affect health in any injurious way.

Inasmuch as the plumbing trade is steadily becoming interested in the merchandising of refrigerating apparatus, and moreover seems to be the reasonable outlet for such apparatus, this lecture was of much interest to the conference.

In closing, a large collection of slides was shown, covering the subject of bacteria.

Keynote of Conference

Whether with intent or not, this year's M. I. T. plumbing conference appeared to have as its leading note, the subject of better educational opportunity for the plumbing trade of the future. In line with this effort, a fifteen minute period was devoted to a description of the aims and organization of the Lowell Institute School, by Prof. Charles F. Park, director of the school. This institution is an evening school for men, under the auspices of M. I. T.

Professor Park introduced his subject by remarking that today there is no good excuse for any individual not being able to obtain an education. A further point brought out was that modern machinery, mass production and many modern methods are leading to the making of much poor material, and that education is the only thing to offset such results. The Lowell Institute was established for the benefit of young men unable to attend day courses, and its purpose is to do what it can in overcoming the wrong conditions named above.

Three courses are given,—mechanical engineering, electrical engineering and building.

The entire equipment of M. I. T. is available to the Lowell Institute, and the instruction is given by members of the M. I. T. faculty. A pleasing feature was the testimony of several members of the conference who are graduates of the Lowell Institute.

"Sanitary Examination of Drinking Water," was the subject of an instructive lecture by Prof. Murray P. Horwood, another favorite speaker who had appeared on each of the preceding conference programs.

Before proceeding with the lecture that he had prepared, Prof. Horwood stated that he had been asked to state his opinion as to whether plumbing had a vital relation to public health.

It should be stated that this subject has in recent months taken on considerable interest, due to radical statements in the negative from several different

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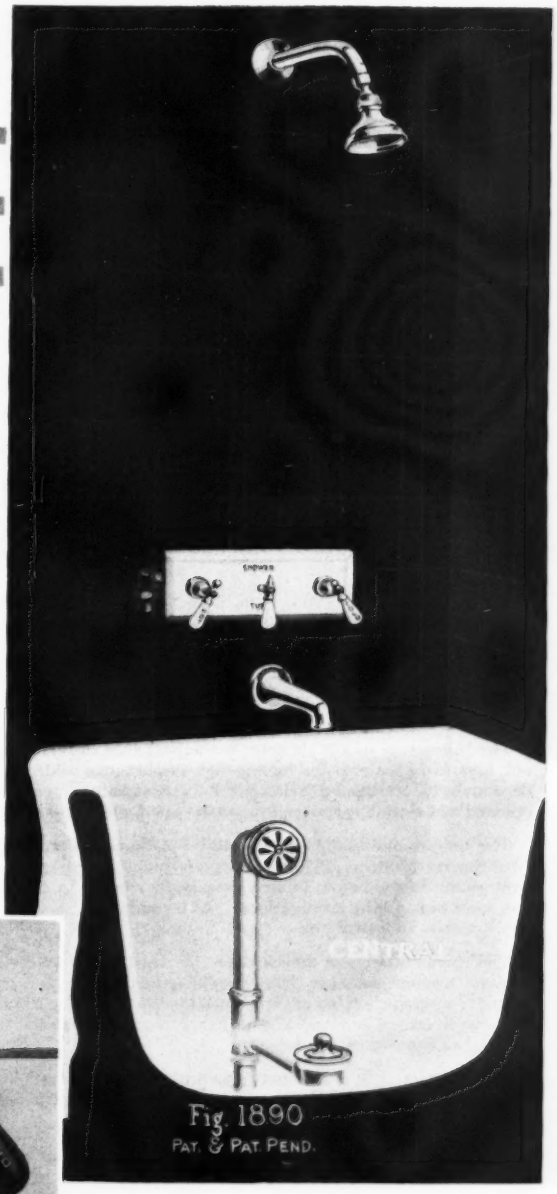

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The elements are not attached to the cap but are held rigidly in place without springs. This simplifies installation and makes all parts interchangeable even by unskilled labor. The discharge opening is larger and the lift is higher than in ordinary traps, giving the Sarco greater capacity.

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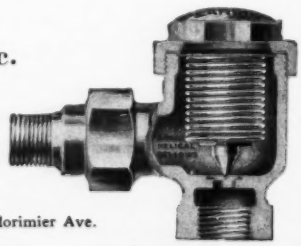

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directions. Only a day or two previous to the M. I. T. conference, at a hearing at the Massachusetts state house in Boston, a leading physician of the state had made the statement at a hearing on the proposed new state plumbing law, that plumbing had no relation whatever to health. For these reasons, Professor Horwood's remarks on the subject were listened to with particular interest.

Plumbing and Public Health

He took a strong stand in favor of the proposition that plumbing actually is vital to public health. His arguments we have reserved for a special article on this subject.

Originally supplied from wells, it was later supplied by aqueducts. No great advance in the supplying of water was made until about the middle of the nineteenth century, but in the last quarter of that century a very great advance was made.

The speaker made the interesting point that his own institution, M. I. T., was very largely responsible for this great advance.

Professor Sedgwick of M. I. T. was the outstanding leader in this work, and it was he who first demonstrated that the epidemics which had visited Massachusetts cities were due to polluted water supplies.

Previous to the historic London epidemic, it was not known that sand filtration purified water.

The qualities of a public water supply are that it shall be sufficient in amount, always available, cool, free of taste and odor, and free of pathogenic bacteria.

Odors in water, due usually to the growth of organisms, may be overcome by aeration, also by the use of chlorine and copper sulphate.

Hardness of water supplies is due to mineral substances taken into solution, such as calcium and magnesium especially.

There is general the popular belief that color, odor and objectionable taste in drinking water are dangerous to health, and the fact that this is not in any sense true, will be reassuring to the many who do not understand this.

There are four different methods of examination of water supplies,—1,—by a sanitary survey, made for the purpose of finding the possible sources of pollution, 2,—by chemical analysis for the purpose of disclosing possible impurities, 3,—by bacteriological examination, which gives by far the most important analysis, and 4,—by microscopic analysis.

The final lecture was by Prof. Thos. R. Camp, the leader of the conference, on the subject, "Methods of Sewage Disposal."

Something like 225 members of the plumbing trade attended this conference, which was fully up to the high standard of the three previous conferences.

The committee of arrangements included Professor Camp for M. I. T.; John J. Downey, Boston; J. Preston Perham, Boston, and Wallace T. Wordell, Taunton, for the Massachusetts State Association of Master Plumbers, and Wm. F. Bennett, Jr., Somerville; Joseph A. Maynard, Waltham, and Frank A. Munroe, Cambridge, for the Massachusetts Sanitary Club.

Local Associations Elect Officers

Local associations of master plumbers in various parts of the country have been busy of late in selecting their officers for the ensuing year. The results of some of these elections have already appeared in Domestic Engineering *and below are reports received from other cities.*

Grand Rapids

The Grand Rapids, Mich., Plumbing and Heating Contractors Association has elected as its officers for 1930, George Segard, president; Chester Grant, vice president; and William A. Decker, secretary and treasurer.

San Gabriel

The San Gabriel Valley Merchant Plumbers Association of Alhambra, Calif., has recently elected the following members to the official staff for 1930: W. R. Bills of Alhambra, president; F. M. Jones of El Monte, vice president; L. M. Hamm of Alhambra, secretary; and C. L. Atkinson of San Gabriel, treasurer.

Lower Bucks

The Lower Bucks and Montgomery County Master Plumbers Association of Glenside, Pa., has elected the following officers: Stewart B. Rorer of Ambler, president; Irvin Ritter, Glenside, vice president; James P. McEntee, Glenside, secretary; and L. C. Madsen, Willow Grove, treasurer.

San Pedro

The San Pedro Merchant Plumbers' Association of San Pedro, Calif., has elected the following officers: Claude Hickman, president; H. H. Wister, vice president; H. Tietz, Jr., secretary; and B. Brasch, treasurer.

Lackawanna

The Lackawanna Valley Master Plumbers Association of Olyphant, Pa., recently elected the following officers: James F. Arthur of Dickson City, president; J. Bohara, Olyphant, vice president; Thomas L. Williams, Jermyn, secretary; and James H. Lally, Olyphant, treasurer.

Hollywood

The Hollywood Merchant Plumbers' Club, Hollywood, Calif., has elected the following officers for the new year: Frank Hassey, president; Joseph Neuerburg, vice president; John W. Fox, secretary; and Preston Freeman, treasurer.

Rochester

The Associated Master Plumbers of Rochester, N. Y., has elected as its officers for 1930: Lothar C. Gresens, president; B. L. Paulus, vice president; Edward L. Miller, secretary; and Herbert M. Saunders, treasurer.

North Orange

The North Orange County Master Plumbers' Association of Anaheim, Calif., has elected the following officers: John T. Frazier, president; C. A. Schalles, vice president; J. F. McConnell, secretary; and H. H. Armbrust, treasurer.

Taunton

The Taunton Master Plumbers' Association of Taunton, Mass., has elected the following officers: Robert MacAdam, president; Ernest C. Simmons, secretary; and Russell J. Park, treasurer.

Fox River

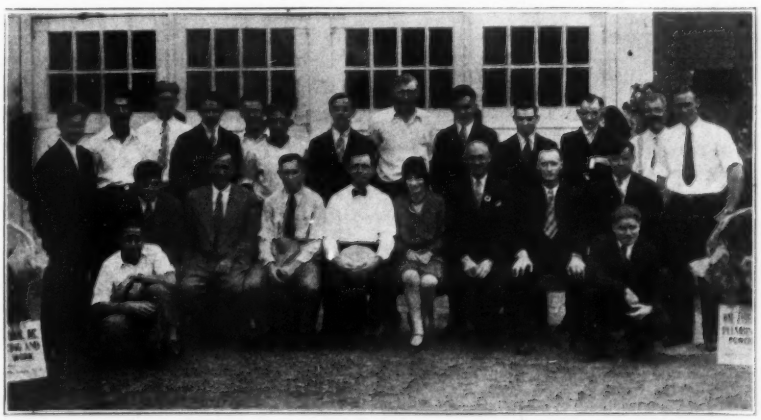
The Fox River Valley Sanitary Club, Green Bay, Wis., has elected as its officers for 1930 A. M. Tweet of Green Bay, president; T. J. Long of Appleton, vice president; and William J. Femal, Green Bay, secretary and treasurer.

Port Huron

The Associated Plumbing and Heating Dealers of Port Huron, Mich., recently elected the following members as officers for the new year: John Barton, president; Hugh Barnes, vice president; Earl Gresley, secretary; and B. Baker, treasurer.

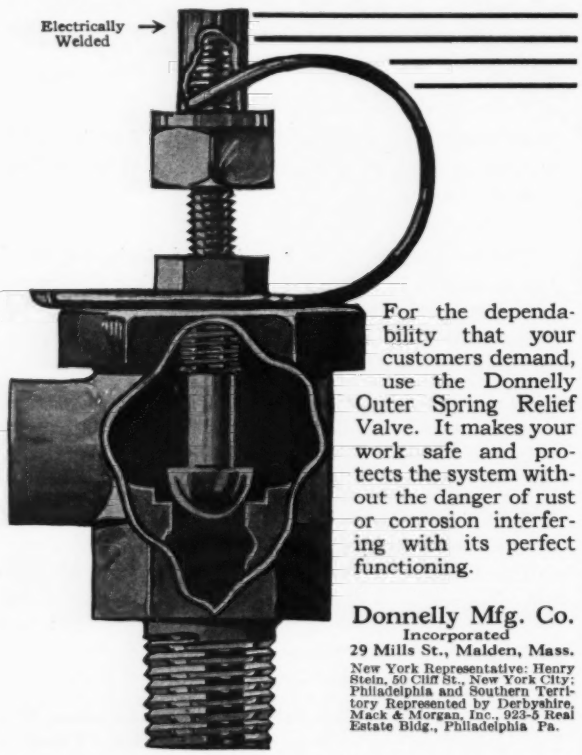
Winona

The Winona Master Plumbers' Association of Winona, Minn., has elected the following officers: Charles J.



Group picture showing part of the organization of William Zabransky, Jr., & Bros., Inc., plumbing and heating contracting firm of Little Ferry, N. J. William Zabransky, Jr., is president of the company

Donnelly Outer Spring Valve



For the dependability that your customers demand, use the Donnelly Outer Spring Relief Valve. It makes your work safe and protects the system without the danger of rust or corrosion interfering with its perfect functioning.

Donnelly Mfg. Co.
Incorporated
29 Mills St., Malden, Mass.
New York Representative: Henry Stein, 50 Cliff St., New York City; Philadelphia and Southern Territory Represented by Derbyshire, Mack & Morgan, Inc., 923-5 Real Estate Bldg., Philadelphia Pa.

Have you any used tools?

No doubt you have. Chances are, they are lying somewhere around your shop. Possibly new tools have replaced the old. These old tools will bring you dollars if advertised in the "For Sale" columns of DOMESTIC ENGINEERING. Some plumber in another locality may be waiting to obtain these tools, in good condition, at reduced prices. The very low rate of 8c per word makes the Classified Page a good buy.

Olsen, president; Albert Bruss, vice president; J. H. Thompson, secretary; and B. J. Loeding, treasurer.

Camden

The Master Plumbers Association of Camden, N. J., recently elected as its officers for 1930, John Emmel, president; Harry L. Anders, vice president; Charles S. Lafferty, secretary; and Edward F. Kelley, treasurer.

Johnson City

The Master Plumbers' Association of Johnson City, Tenn., has elected as it officers for the ensuing year, A. H. Abernathy, president; C. O. Biddle, vice president; W. P. Davis, secretary; and J. H. Preas, Jr., treasurer.

Evansville

The Evansville Master Plumbers' Association of Evansville, Ind., recently elected Walter Newman as its president for 1930; Carl Blum, vice president; Owen Monroe, secretary; and C. R. Saberton, treasurer.

Lake County

The Lake County Sanitary & Heating Engineers Association of Lake Forest, Ill., recently elected J. H. Moran of Highland Park, as president of the association for the year 1930; J. T. McGrath, Libertyville, vice president; Lester V. Anderson, Lake Forest, secretary, and Arnold Peterson, Ravinia, treasurer.

Jersey City

The Master Plumbers' Association of Jersey City, N. J., at a recent meeting, elected Edmund P. Ingram as president for the year 1930; George Cooper, vice president; James T. Brennan, secretary; and Louis S. Komoski, treasurer.

William F. Bailey, Henry A. Cohendet and John J. Crosby were chosen for the board of directors.

Shamokin

The Shamokin Association of Master Plumbers of Shamokin, Pa., recently elected Price Long as president for the year 1930, and R. E. Zuern as secretary.

Long Beach

The Master Plumbers' Association of Long Beach, Calif., has recently elected the following officers: H. R. Gerald, president; F. J. Burch, vice president; and P. W. Coffey, secretary.

Bakersfield

The Master Plumbers' Association of Bakersfield, Calif., has elected the following officers for the coming year: Charles Daly, president; E. J. Norris, vice president; and T. R. Jones, secretary-treasurer.

Portland

The Heating and Piping Contractors Portland (Ore.) Association re-elected Eugene Ruedy president of the association for the year 1930, at the annual meeting held in the offices of the organization in the Sherlock building. F. De Temple was elected vice president; H. H. Colliver, secretary, and William R. Campau, treasurer.

Jacksonville

The Jacksonville, Fla., Master Plumbers' Association has re-elected the following officers for the year 1930: D. A. Mayfield, president; Harry Pepper, vice president, and Robert Engstrom, secretary-treasurer.

Ontario Masters Confer on Apprenticeship

Concluding a conference of six hours' duration, ten plumbing and heating contractors from various parts of Ontario, meeting in Toronto, gave their approval of the Apprenticeship Act and Regulations, subject to certain provisions. J. M. Piggott, who headed the committee, occupied the chair.

The complete motion carried by the group was to the effect that the conference approve of the Apprenticeship Act and Regulations as drawn, providing that the Provincial Apprenticeship Committee consider and give effect to the recommendations and suggestions presented by this conference.

The reservations made by the conference were those regarding wages, number of apprentices and the continued employment of minors, who, now employed, the masters could not see their way to indenture.

The regulations concerning continuous employment were approved, subject to an adjustment of wages which would make it possible for the employer to provide continuous employment under existing conditions. Dealing with wages, it was decided to ask the provincial committee to continue for the present time the old minimum rate of $7, $9, $11 and $15.

The eight weeks' course of school training was approved, provided that the employes receive remuneration to at least 50 per cent of cost by assessment.

Consideration of action regarding unindentured minors was finally concluded by a carried motion that the provision be made whereby employers shall indenture as many minors now employed as they are prepared to place under contract and that the others be carried on the payroll until such a time as they may cease to be employed by their present employers or complete the full apprenticeship period. It was agreed that this privilege be extended only to employers who indenture one or more minors.

Contractors in attendance included P. Marshall, W. F. Clifton and H. A. Weinraub, all of Toronto; Norman Clark and W. A. Brittain of Hamilton; Judge McKinley and R. A. Seasons, Ottawa; J. J. Druce and A. Lemmon, Kingston; A. Ross of Windsor and J. Stirling of Port Arthur.

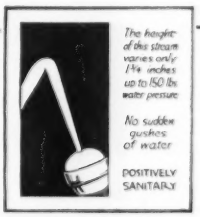
Representing the Provincial Apprenticeship Committee were J. M. Piggott, chairman; J. B. Carswell and George Oakley.

◆

Bronx Masters Enjoy Beefsteak Supper

A beefsteak supper dance at which the Master Plumbers' Association of the Bronx, New York City, was host on January 25 at Ebling's Casino in that borough, attracted close to 300 members, their families and friends. Among those present were Fergus McLoughlin, president of the New York State Association; Vincent J. Duffy, state secretary, with Mrs. Duffy; John J. Dixon, state treasurer; William J. Flynn, past state president; Mr. and Mrs. T. P. McLoughlin; P. H. Gleason with his daughter, Miss Gertrude Gleason, and M. J. Kennedy, past state president, with Mrs. Kennedy. A group from the Borough of Queens included John F. Rogers; Mr. and Mrs. William E. Foley; Mr. and Mrs. N. P. Donohoe; Mr. and Mrs. Joseph Stockinger; Mr. and Mrs. J. Stockinger, Jr., and Mr. and

Read the Details of This New Unique Invention


The height of this stream varies only 1¾ inches up to 150 lbs. water pressure
No sudden gushes of water
POSITIVELY SANITARY

It is changing all previous ideas of Automatic Drinking Fountains. It gives a degree of efficiency heretofore unavailable. It eliminates . . . for the first time . . . the necessity of wasting water to hold the drinking stream constant.

Here is truly automatic control of the drinking stream. Under tests the Century Development performed with this definite accuracy. With 5 pounds pressure the drinking stream was 1¾ inches high; with 45 pounds pressure the drinking stream was 3½ inches high; and from 45 pounds pressure to 150 pounds pressure there was absolutely no variation in the drinking stream.

Wasting Water Is Costly

Not only does the Century invention banish forever sudden splashing gushes and inconvenient, unsanitary trickles, but it does not waste a single drop of water. Realize what this means. Think of the actual savings in water costs . . . in cooling costs . . . and on refrigerating equipment. Learn now all of the outstanding features of Century Fountains. See illustrations of the attractive 1930 line. The full story is contained in the new Century Catalog. Write for it today.

CENTURY BRASS WORKS, INC.

906 N. Illinois St. Belleville, Illinois

Century SANITARY DRINKING Fountains

Mrs. William W. Metcalf of Rockville Center, L. I.

Mr. and Mrs. George Arnone, secretary of the Bronx organization, entertained a party at one of the tables which included Mr. and Mrs. J. B. Daly; Mr. and Mrs. Michael White; Mr. and Mrs. Walter Weiss; Mr. and Mrs. Arthur Gutjahn, and Alfred Fredericks.

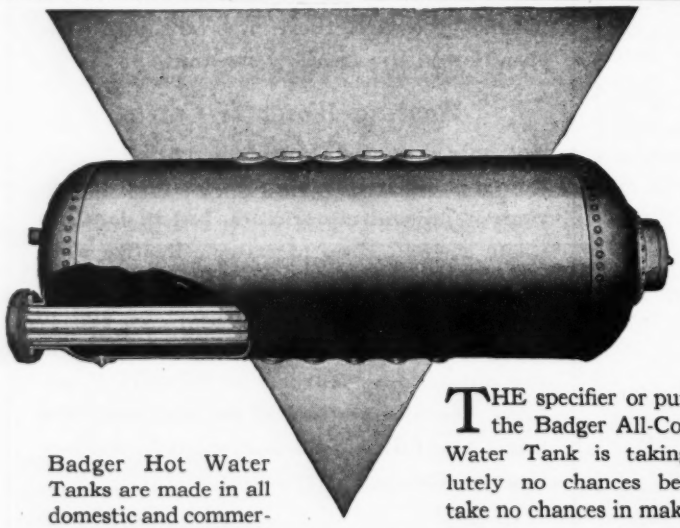
In addition to the state executives and their families the Manhattan association was well represented by its chairman of the board of governors, Richard Anderson; Joseph Spellman; A. A. Duguid; Executive Secretary Alex Brown, and a number of others.

The committee on arrangements was headed by Fred Schmalstich, assisted by Woodward Ebner; Anthony Platt; Secretary Arnone, and President Sugarman.

Beefsteak dinner given by the Bronx Master Plumbers' Association at Ebling's Casino

Scranton, Pa., Association Holds Large Meeting

A dinner meeting arranged especially for the occasion by the Master Plumbers' Association of Scranton, Pa., on January 29 at the Hotel Casey was addressed by E. D. Swoyer, vice president of the Pennsylvania state association, and Joseph G. Hildebrand, state field representative. In their talks each touched on the work that is being done throughout the state and in addition Mr. Hildebrand described the business value derived by the many master plumbers who attended the sales demonstration meeting that was given recently by the Master Plumbers' Association of Johnstown, Pa. It was announced at the meeting later that a one day sales demonstration will be presented in Wilkes-Barre in the near



Badger Hot Water Tanks are made in all domestic and commercial sizes. Equipped complete with coils and fittings.

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THE specifier or purchaser of the Badger All-Copper Hot Water Tank is taking absolutely no chances because we take no chances in making them.

The highest standard has been set in the selection of the metal, in the design and in the workmanship that go into Badger Tanks.

As far as it is humanly possible to provide for it, nothing has been left undone to make the tanks perfect.

And being so high grade they are the best investment that can be made in hot water tanks.

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Houston, Texas, 1308 2nd Nat. Bk. Bldg.
Los Angeles, Cal., 517 Hollingsworth Bldg.
Minneapolis, Minn., 732 Builders Exchange
Montreal, Quebec, Canada Cement Bldg.
New York, N. Y., 271 Madison Ave.
Philadelphia, Pa., 1500 Walnut St.
Pittsburgh, Pa., Union Trust Bldg.
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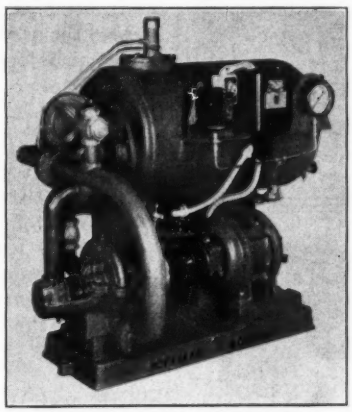
Abnormal conditions may not develop on every heating installation, but to make sure of satisfactory performance, equipment should be selected that allows for all contingencies.

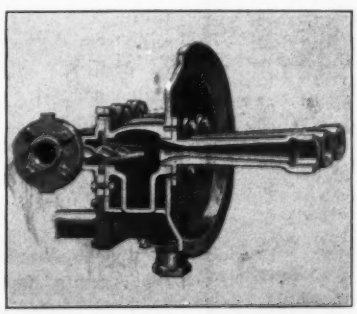
The ability of Hoffman-Economy Vacuum Pumps to handle extremely hot water eliminates one of the most common troubles experienced with such equipment. Positive action in removing air from the system and in returning condensation to the boiler is assured at all times.

The jet type vacuum producer used on Hoffman-Economy Pumps is efficient and trouble-proof. It has no moving parts, never wears out, and avoids close clearances on the pump.

Standard Hoffman-Economy Vacuum Pumps "pull" a high vacuum and will operate against 20 pounds boiler pressure. Location of return inlet and float switch close to floor reduces pits and lift fittings to a minimum.



HOFFMAN ECONOMY VACUUM PUMPS



Other types of Hoffman-Economy Pumps are: Horizontal Condensation Pumps, Reciprocating Pumps, Vertical Underground Pumps and Air Line Vacuum Pumps. All units are sturdily constructed, mounted on heavy cast iron base, and equipped with motors of standard make and size. Write for complete information. Hoffman Specialty Company, Inc., Dept. X-33, Waterbury, Conn.

For complete technical information on all Hoffman Heating Equipment send for our new 60-page catalog.

◆ ◆ ◆

Hoffman-Economy jet type vacuum producer is the simplest and most dependable method for exhausting air and vapors from heating systems.

All Lead-Copper-Galvanized Iron

SIMPLEX AND JUNIOR FLASHINGS FOR EVERY ROOF CAN BE HAD IN EACH OF THE ABOVE METALS.

Write for prices and full information on the easily installed, durable SIMPLEX and JUNIOR Flashings.

SIMPLEX MFG. CO.
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"Junior Flashings"

STACK RED METAL BALL COCK

1. Noiseless.
2. Removable Seat.
3. Will operate efficiently against high or low pressure without change of float or seat.

Ask your jobber and write us for Catalog No. 36.

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THE STACK HEATER COMPANY

BALL COCKS, INDIRECT HEATERS, GAS WATER HEATERS, HEAT INTERCHANGERS, HOT WATER GENERATORS — STACK Products — RELIEF VALVES, NO-TANK VALVES, NONSIPAS VALVES, STEAM WATER MIXERS, PRESSURE REDUCING VALVES

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Quick, Easy Installation of All Wall-Hung Radiators

Install radiators this modern way—hang them from the wall with E-Z Radiator Hangers. Better looking, more sanitary, easily installed and inexpensive.

Three styles for ALL installations. Leading architects and contractors recommend and use them. Write for complete information.

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There isn't a roof job you'll ever encounter that will not be completely satisfied by the Overton Roof Flashing.

Any pitch, any kind, any color, the Overton looks and serves better.

Ask your jobber today for Overtons.

BUTLER MFG. CO.
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future, which will be attended by the Scranton members. This was the first visit of Mr. Hildebrand to Scranton and he was greeted by an unusually large attendance, many having come from adjacent sections. James F. Arthur, president of the Lackawanna Valley Association, and James H. Lally, treasurer, were accompanied by a delegation from that section of the state.

John T. Decker, president of the Scranton association, presided at the meeting, arrangements for which were made by William A. Schneider, secretary-treasurer; Thomas F. Gaughan, Stanley Florey, and Carl V. Wenzel.

◆

Asheville, N. C., Masters Hold Special Meeting

The Asheville (N. C.) Association of Master Plumbers, and officials of the state organization, held a special meeting on February 12 at the shop of E. B. Wright, 227 Haywood road, West Asheville. The state officers present were H. S. Ritchie of Albemarle, president; E. B. Grady of Concord, secretary-treasurer, and L. J. Haley of Charlotte, vice president.

Leon Lawrence of Charlotte talked on trade practice rules and C. C. Jordon outlined the purpose of the recently established educational bureau in Raleigh. He stressed the need of closer co-operation between the master plumbers and the state health officials. Each of the state officers present also took an active part in the meeting.

◆

New York Master Goes to Florida

Edward Breakell of 222 Lexington avenue, New York, N. Y., an oldtime master plumber of that city, left recently for a vacation in Florida. Mr. Breakell has been connected with the trade for some thirty or thirty-five years. He is a member of the Manhattan Branch of the New York Master Plumbers Association.

◆

North and West Side Club Holds Dinner-Dance

The North and West Side Master Plumbers Pleasure Club, Chicago, held its annual dinner-dance at the Germania club on the evening of February 15. Approximately 250 members and guests were present. The committee in charge of the affair had arranged for a delicious dinner, immediately following which dancing was in order.

◆

Moline Master Joins Hole-in-One Club

J. V. Lockhart, president of the Master Plumbers Bureau of Moline, Ill., while vacationing in Florida recently with Mrs. Lockhart, joined the hole-in-one club. He made the ace while playing on the Maraville course, near Vero Beach, with A. V. Esterdahl of Moline. Mr. Lockhart's score for the eighteen holes was 94.

◆

Appointed Chief Plumbing Inspector of Atlanta

E. G. Quarles has been appointed to fill the office of chief plumbing inspector for the city of Atlanta, Ga., to take the place made vacant by the retirement of J. A. G. Beach. Mr. Beach, who made a long service record in the Atlanta department, recently was retired and has gone to Miami, Fla., for his health.

Organize New Merchant Plumbers' Club in Los Angeles

The South Side Merchant Plumbers' Club of Los Angeles, Calif., is the latest such organization to be brought into active existence in that city. The club has at present about forty members, with the prospect of an increase in the near future. H. Finlay has been chosen president, and William Nies, secretary, of the new organization.

For the present, during the process of perfecting the organization, meetings are held every Tuesday evening. President Finlay says that until the possibilities of the membership are realized upon, no definite program of activities will be undertaken, the first effort of the club being to foster a get-together spirit among the neighborhood merchant plumbers.

◆

Philadelphia Suburban Association Elects Officers

The Philadelphia, Pa., Suburban Master Plumbers' Association has elected the following officers for the year 1930: E. N. Sharp, president; Gerald McCleary, vice president; William Stranaghan, secretary; and Ross Baldwin, treasurer.

Among the directors elected were Warner White, Phillip Barrow, Joseph Green, William Hughes and A. L. Simons.

◆

Salt Lake City Association Elects Officers

George M. Whitely, vice president of the Salt Lake City, Utah, Sanitary and Heating Engineers Association, was elected president of that organization at a meeting held on February 6. In addition to serving as vice president, Mr. Whitely has also been a member of the board of governors during the past year.

Other officers elected were: Vice president, Joseph F. Carthey; secretary, Ross Dudley; treasurer, C. J. Dietz; sergeant-at-arms, Simon Gentner. Peter P. Erskine, the retiring member of the board of trustees, was again selected as a member of that board, which in addition, includes Will Rees and Joseph F. Carthey. The board of governors is appointed by the president.

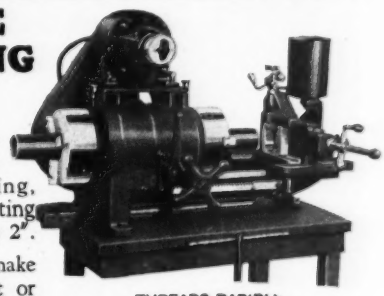
Retiring President Parley G. James expressed his appreciation for the work and co-operation of the following board members: Will Rees, Edmund G. Harris, Joseph F. Carthey, Ambrose H. Higham, George M. Whitely, and George W. Bruerton.

Left to right: C. E. Pullum of Bell & Gossett Co., Chicago, and W. H. Hendricks of Rockford, Ill.

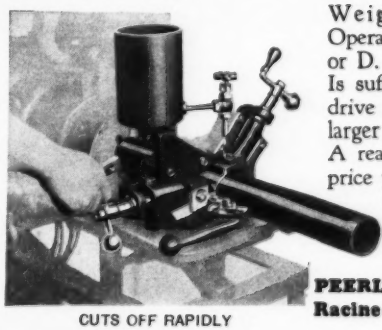
CUTS PIPE THREADING COSTS!

A full-fledged Portable Pipe Machine for Reaming, Chamfering, Threading and Cutting Off pipe from ⅛" to 2".

Uses any standard make of solid square right or left hand pipe or bolt dies.



THREADS RAPIDLY



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Weighs 250 pounds. Operates off either A. C. or D. C. lighting circuits. Is sufficiently powered to drive geared heads on the larger pipe, up to 6 inches. A real pipe machine at a price you can afford. Ask us about it today. Give us the name of your supply dealer.

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Pipe Threading Machines Production Precision
Latest and Most Advanced Types on the Market
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Warren, Knight & Davis, *Archts.* Mason & Dulion, *Plbrs.*
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PROTECTIVE LIFE BUILDING
Birmingham, Ala.

Equipped throughout with

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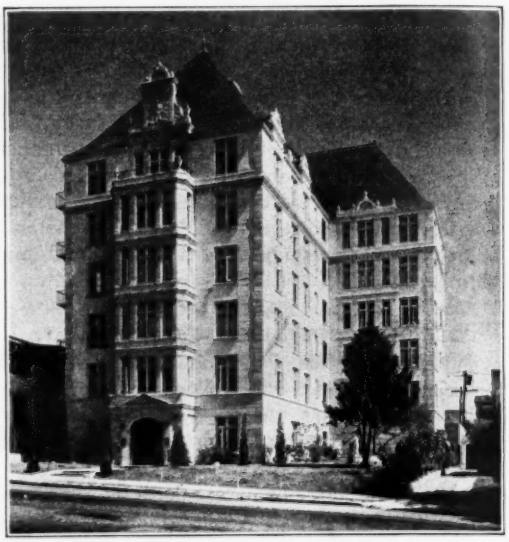

L. A. Bryant, Los Angeles, *Archt.* T. L. Wall, Brentwood, *Plbr.*
A. E. Lyon, Inc., Glendale, *Fixtures*

SAVOY PLAZA APARTMENTS
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Equipped throughout with

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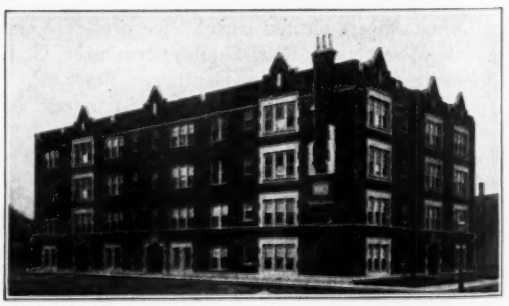

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APARTMENTS—62d PL. and SEELEY
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Equipped throughout with

GEM FLUSH VALVES

SLOAN VALVE CO.—CHICAGO

Branches in All Principal Cities

MARKETS

BUSINESS REPORTS FROM LARGE JOBBING CENTERS

Fittings Market Shows Activity

CONSIDERABLE activity was found in the fittings market during the fortnight just passed when the decision of certain manufacturers to sell malleables on a piece instead of a pound basis was accompanied by a price reduction by some makers on cast iron and malleable types. Many wholesalers took advantage of the lower prices to cover on their future needs. The only other price change of any note during the period was on welded storage tanks, announcement being made by at least one manufacturer in the New York territory of higher prices to jobbers.

Except for the heavier purchasing occasioned by the above mentioned price changes, wholesalers showed little inclination where the other major commodities were concerned to place business with manufacturers for other than their current needs. In this respect, business in plumbing and heating was much the same as in the preceding fortnightly period, except for a slight quickening in some instances due to ordinary first of the month buying. Contractor activity, however, failed to show much change and, as a result, jobbers' turnovers continued moderate. Reports indicate that the market on most items is firm at current sheet levels and manufacturers as a general rule are shipping material on schedule.

MIDDLE ATLANTIC

Slight Gains Are Reported In Business—

A summarization of business in the Middle Atlantic section during the past thirty-day period reveals that a slightly increased turnover was enjoyed by most wholesalers interviewed. Master plumbers and heating contractors have been moderately engaged in replacement work during the month, and in a few instances, new projects have been started. An optimistic tone is apparent among those interviewed, most wholesalers and manufacturers being of the opinion that the coming months will bring forth increased activity. Some distributors have already anticipated this trend as reflected in new orders received for future delivery.

Reports emanating from the Washington, D. C., section indicate that the demand for plumbing and heating goods in that section has taken an upward turn with many new projects contemplated for the coming spring months. This section was rather dull during 1929, with the exception of the usual government construction. Volumes in practically every commodity fell short of last year's total for February, it is reported. Stock replacing by jobbers is light, small orders still predominating as they are received by producers.

F. W. Dodge Corporation reports construction figures for the fifth and sixth weeks as being approximately the same as the previous two weeks. The total valuation for the sixth week having been $6,573,200 and the seventh week totaled $5,194,500, of these totals, they were divided approximately in thirds as to residential, nonresidential, and public utility projects.

Soil Pipe

Reflected in the demand for soil pipe from the standpoint of the master plumber is the seasonal recession to be expected at this time. However, soil pipe is enjoying probably as good a market as other commodities at this time. February business is on a par with January, according to most makers' representatives. Prices are unchanged and factories are making quick deliveries.

Pipe—Brass, Steel and Wrought Iron

Steel pipe salesmen interviewed say that tonnages for February show only a slight increase over January, and are not equal to last year's volumes for the same thirty-day period. Wrought iron pipe moved into the market at about the same pace as reported for the past few reviews, although it is said that several projects are now being planned which should require wrought iron pipe. Brass pipe producers' salesmen are not noting any increase in activity, demand remaining on a par with that of the first month. Prices of all three items remain the same. Deliveries are prompt.

Fittings

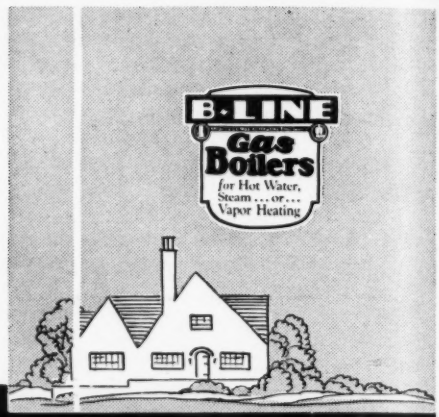
Small sized orders are reflecting the receded demands of master plumbers for cast iron and malleable fittings. Contractors' requirements have been light for some weeks and distributors show little inclination to place stock orders at this time, with the exception of small lots to replace those sold. Manufacturers are shipping without delay. Since our last review several producers have announced a reduction in prices on cast iron and malleable types, and certain makers have decided to sell malleables on a piece basis.

Enameled Ware

The advance in prices of certain enameled ware fixtures announced during the time of the last review has stimulated some buying on the part of wholesalers, principally for future delivery. Demand for these fixtures by contractors is limited to renewals and some few large projects just being completed, the orders for which were placed some time ago. Colored ware is holding attention with home owners and many of the replacements in dwellings call for this type of fixture, it is reported.

Pottery

With wash-down bowl and tank prices advancing during the previous fortnight, some new business was realized by potters on these staple items. In a few cases, fixtures were



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When you handle B-Line Boilers you've got something more to sell than a bundle of iron and crate of controls . . . you're selling heat!

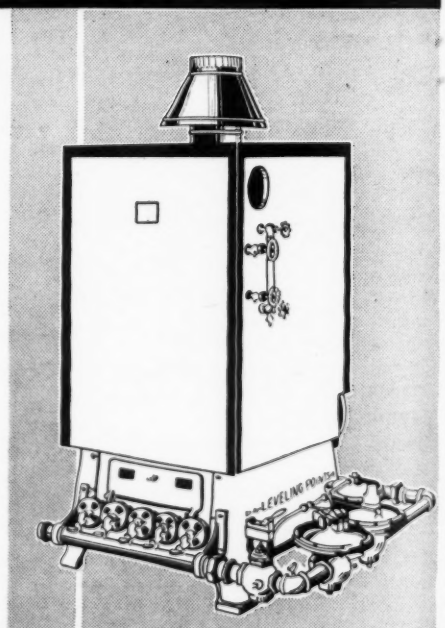
And it's the HEAT you can GUARANTEE . . . not just parts.

Tell your customers that B-Line Boilers are guaranteed on a money back basis to heat their homes to their satisfaction. We back you up on that.

Tell them, too, B-Line will heat for less money . . . it will. Tell them also that they get more boiler per dollar when they buy B-Line . . . they do.

These are simple selling truths substantiated by records, statistics, impartial tests and what is more important . . . the experience of thousands of B-Line users.

Armed with these selling weapons, you have the edge on any competitor you may meet. Use them and you'll find B-Line Boilers remarkably easy to sell.



B-LINE BOILER COMPANY
CLEVELAND, OHIO

required for residences of the better type started earlier, and some larger commercial projects just being completed were released for shipment, making the month slightly better than January in point of shipping volumes, in the opinion of potters' salesmen interviewed. Prices remain the same and potters have ample stocks on hand to make expedient shipment.

Plumbers' Brass Goods

The rejuvenation of stocks by wholesalers took place earlier in the year, according to representatives of the makers, and a scarcity of quantity orders is evident at this time. The month, nevertheless, produced a fair quota of small orders, as goods were required by contractors from time to time. The slackening is quite apparent, but on the whole optimism prevails as to future business. Prices are the same as previous levels, and deliveries are effected without delay by makers.

Range Boilers

Although the past thirty-day period did not witness an increased volume of business compared with January, the firm manifestation of prices continues to be the bright point of this commodity. Contractor demand is not equal to last year at this time, and volumes are likewise depleted in comparison. Deliveries are made quickly, as producers' stocks are sufficient to meet all commitments.

Boilers and Radiators

A heartening upward tone was reported by manufacturers' salesmen in the last few days, whereas business throughout the other days of February was rather dull. This is ordinarily to be expected at this time; but it is thought by some sellers that March and April will see a return of activity resembling that experienced during November and early December. Prices are unchanged. Factories are delivering promptly.

CENTRAL WEST

Contractor Buying Continues Light—

Information furnished by manufacturers and wholesalers since our last review appeared indicates that business in plumbing and heating continued to hold at no better than a "fair" level for this season of the year. The volume of material going into actual consumption, according to most wholesalers interviewed, is considerably below that of a year ago at this time. Activity among master plumbers and heating contractors in Chicago proper is said by jobbers to be slow and it is the construction activity in the outlying districts that seems to be contributing most to wholesalers' volumes at the present time.

Wholesalers show little inclination to place orders for material with manufacturers' salesmen and the bulk of buying that is being done by jobbers is for near-at-hand requirements. The recent price advances in soil pipe, enameled ware and pottery brought some jobbers into the market for their later needs, but others say that they already had good enough stocks of most of these items to last for some time without ordering fresh material. Manufacturing sources are in possession of ample and well-assorted stocks and deliveries to wholesalers are going forward on schedule, almost without exception.

The closing days of February brought the news of a price reduction by some manufacturers on cast iron and malleable fittings, and also that certain producers had decided to sell malleables on a piece basis instead of by the pound.

Soil Pipe

Contractor requirements for soil pipe were not heavy during the past fortnight and with their turnovers only moderate wholesalers did not place any amount of business with manufacturers. In the majority of cases jobbers have enough soil pipe in stock to take care of the needs of their customers without calling upon producers to any great extent. Foundry stocks are of good size and deliveries are prompt. Makers have not changed their published prices to wholesalers.

Pipe, Steel and Wrought Iron

Consumption of steel and wrought iron pipe by the plumbing and heating trade was just about seasonally fair during the past two weeks. Distributors' racks contain average quantities of these two types of pipe and as a rule ordinary requirements can be taken care of from stock. Jobbers are not purchasing much beyond their current needs. Mills have good stocks and are making quick deliveries in all cases. Producers have not changed their published prices to their distributors and the market generally is reported firm on both steel and wrought iron.

Fittings

Since our last review was published some manufacturers have announced a substantial reduction in their prices to wholesalers on cast iron and malleable fittings. Word has also been received that certain manufacturers have decided to sell malleable fittings in the future on a piece basis instead of by the pound. Other types of fittings were not changed in price. Contractors' needs in the way of fittings are not of large proportions at this time, with the result that jobbers' turnovers are light. In the majority of cases makers are making prompt deliveries to their customers.

Enameled Ware

The demand for enameled ware has been rather moderate since the recent advance in makers' prices to wholesalers. Most jobbers report buying only in amounts necessary to meet current needs. Contractor requirements are not heavy at this time. Makers are maintaining a program of prompt deliveries.

Pottery

Activity in pottery was only fair during the period. Most jobbers, though, had ordered quite freely at the time of the last price advance. Makers' prices to wholesalers were not changed during the fortnight. Potters are in a position to grant immediate attention to orders on staple items.

Plumbers' Brass Goods

Manufacturers' salesmen interviewed in this district indicate that jobbers are following the same policy in regard to this item as in most others, buying mainly for current needs. Makers have made no changes in price sheets since our last review. A few jobbers have experienced fair-sized orders from contractors busy with replacement work, but new work has remained on a level of comparative inactivity. Factories are able to make shipments promptly on practically all items.

Range Boilers

Most manufacturers of range boilers report only a fair volume of business for this season. Makers' stocks are sufficient to meet all commitments, and deliveries are meeting with no delay. No price changes have been announced and the market is reported firm at current levels.

Boilers and Radiators

No developments of an outstanding nature marked business in boilers and radiators in the period covered by this review. Manufacturers' representatives interviewed state that business progressed along much the same lines as during the previous two-week period and wholesalers report only a fair demand from their contractor customers. Factories are granting quick shipments and makers had not changed their published prices at the time of going to press. Jobbers are holding only fair sized stocks.

NEW YORK

Slight Change Apparent In Volume—

Specifications of wholesalers showed the usual spurt in most lines about the first of the month, and, while in the opinion of many distributors interviewed, contractor business is below that of a year ago, on the other hand, manufacturers report, in many instances, that business is comparable with that of early March in 1929. This in some instances is attributed to the lower inventories with which wholesalers entered the current year.

Owing to the deflation in commodities such as coffee, wheat and sugar, the export trade is reported to be at a low ebb, inasmuch as building in South America and Cuba has been adversely affected. It is also reported that there has been some severe competition from continental Europe on certain items.

Credit conditions in the Metropolitan area are slowly improving with the passing of time, due to the fact that money conditions are slowly becoming easier, according to close students of the situation. It is felt, however, that several old scores must be settled before any real progress is made by many builders in the way of starting new operations in outlying counties.

The trend of new building based on contracts let, is put in a long range perspective by the chart shown herewith. Wholesalers who have studied building statistics in this territory for many years feel that the dip in 1929 was small when taken in comparison with the virtual dearth of money available for construction loans and mortgages, and from this fact it is felt by some that a substantial backlog of new construction is merely awaiting the availability of funds to proceed.

Soil Pipe

Shipments of soil pipe, made about the first of the month, while not comparable with those of a year ago, nevertheless were of heavier volume than for some months, according to several manufacturers interviewed. This was due in part to the pending increase in freight rates, it is said. Wholesalers report that small tonnage is moving to contractors, inasmuch as there is relatively little demand at present for new construction. Prices are unchanged since the time of our last report, and stocks on hand among wholesalers are somewhat higher, with plant inventories low, according to reports.

Pipe—Brass, Steel, and Wrought Iron

Prices of all types of pipe have remained unchanged during the past fortnight, both among wholesalers and manufacturers. Brass pipe is moving steadily into new projects under way, and wholesalers are ordering in accordance with consumer demand; shipments are not as heavy from mills, according to most reports, as they were at this time a year ago, although students of conditions feel that volume at that time was no criterion owing to the rapid succession of advances in copper. The volume of steel and wrought iron pipe moving to wholesalers is felt to be on a par with that of a year ago, according to many interests. Inventories are at bare working levels at most points of distribution.

Fittings

The volume of shipments of brass fittings continues to be well maintained in accordance with the heavy demand occasioned some time ago by the change in price. Inventories of wholesalers on this item are said to be somewhat heavier than obtained earlier in the year, and it is reported that contractors have bought heavily against requirements for contracts in sight. Since our last review certain makers have announced their decision to sell malleables on a piece basis, and this news was accompanied by a price reduction on cast iron and malleables by some makers.

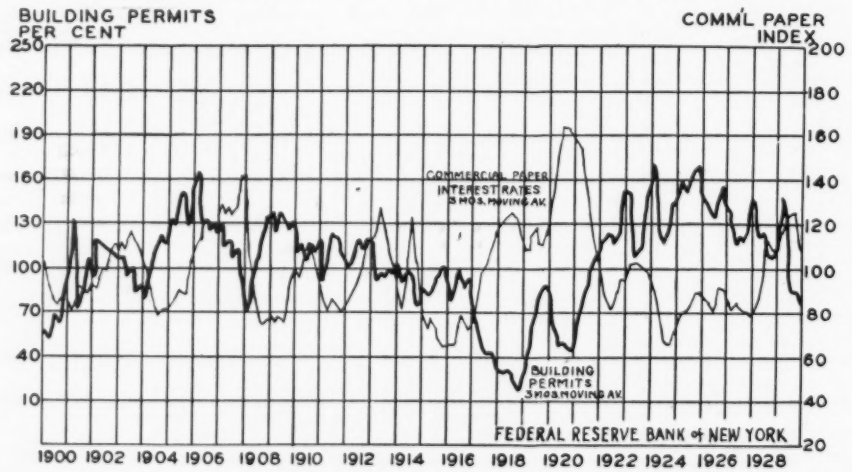
Pottery

The advance in some items of pottery stimulated shipments to a considerable extent at the turn of the month, and makers report that specifications are coming in more freely than had been anticipated. While the volume is scarcely comparable with that of a year ago, according to most makers, inventories are considerably lower, and the movement of material is on a basis much more satisfactory to all concerned. Prices are characterized as firm at all points of distribution.

Enameled Ware

Shipments of enameled ware continue to be favorably influenced by

Building in Relation to Commercial Interest Rates



Building activity in terms of percentage change from the line of normal growth, allowance being made for changes in building costs, compared with the course of interest rates on commercial paper, in terms of percentage changes from the average rate of last half century. Latest figures, November, 1929.

the advance in prices, and wholesalers report sales to contractors are increasing. The demand for colored ware and specials has remained fairly stable, and such requirements are stated to be for replacements for the most part. Inventories are of normal proportions with wholesalers and at plants, and no further changes in prices have been reported.

Plumbers' Brass Goods

Wholesalers are showing but little inclination to buy for future requirements, according to most manufacturers interviewed, and frequent small specifications are characteristic of present day buying. Wholesalers report that in some territories requirements for tubular brass have increased moderately during the past fortnight. Quotations by wholesalers and manufacturers remain unchanged and inventories are considered low by leading interests.

Range Boilers

The decrease in construction of one-family homes in the suburban areas has caused some decline in the volume of range boilers delivered by wholesalers in those territories, according to reports. On the other hand, replacement demand is increasing both for boilers and more especially in the city proper for storage tanks. On March 3 at least one maker announced an advance in prices on welded storage tanks.

Boilers and Radiators

According to several wholesalers interviewed there has been a well sustained demand for replacement and renovation work, but requirements for new construction have of course, declined. Prices are firmly maintained by manufacturers and wholesalers alike. Inventories at distributing points are low, according to leading interests.

NEW ENGLAND

Consumption Requirements Are Moderate—

The past several weeks disclosed nothing new in the way of extensions of activities in contractor demand. In fact, the whole month of February showed some decline in the volume of material consumed, for building activities have been at a comparatively low ebb. New construction incepted since the first of the year has not gained sufficient momentum to create the additional work which master plumbers had hoped for, there being however, a sizeable volume of previous contracts to be completed which, at present and in the near future, sustain the employment situation in seasonal measure. Architects' offices are well engaged in planning prospective work and it is expected that the months of March and April will see the realization of many of the presently proposed projects. Manufacturers' and wholesalers' estimating departments are being called on more frequently for quotations, which indicates a somewhat revivified prospectus for the near future.

With comparatively light consumption demand obtaining, wholesalers have not shown inclination to augment their holdings, except where price changes by manufacturers made bolstering expedient. The majority of jobbers are well stocked, or have in transit, sufficient quantities of enameled ware and pottery to care for their spring requirements. Purchases by distributors, of brass fittings and cast iron, malleable and drainage fittings, have been of good proportions during the past month. The decision of certain makers to sell malleables on a piece basis was accompanied with the announcement by some producers of a price reduction on cast iron and malleable types. Deliveries from sources are being effected in a manner which indicates the maintenance of good reserve supplies.

Soil Pipe

The past two weeks showed little if any change in the nature of master plumbers' requirements of this commodity. The amount of roughing work, while not below par for this season of the year does not require any substantial tonnage, which naturally is reflected in wholesalers' and makers' weekly volumes. Stocks at wholesaling points are of ample nature and deliveries to the plumbing trade are not delayed. Foundries also show ability to forward on dates requested.

Fittings

Current demand from contractors does not account for any large movements from wholesalers' stocks. Most jobbers are amply stocked for their next two to three months' requirements in brass fittings. There is but little activity in jobbers' turnovers of cast iron and malleable and drainage items, yet they have evinced some concern in the status of their stocks due to fluctuations in makers' quotations, a number of which declined during the past week. Makers are in position to make prompt shipments.

Pipe—Brass, Steel, and Wrought Iron

Purchases of the various classes of pipe during the past several weeks showed no particular interest for jobber or producer. Activities in the heating field account for fairly good dispositions of steel pipe by distributors but demand for this commodity shows some decline since the first of the year. Wrought iron mill representatives have a number of industrial and municipal projects in view which will help their sales considerably during the several months following. Wholesalers report seasonally good turnovers of brass pipe but these and their commitments to manufacturers, reflect the levity of progress in new building. Mill prices are unchanged. Deliveries are being executed in prompt manner.

Enameled Ware

While there is only a scattering of carload business being received by manufacturers' salesmen, there is considerable optimism shown, nevertheless, in the increase of quotations for major and residential operations. Both makers and wholesalers consider it a good omen that their estimating departments are well engaged, for this indicates to them early resumption of an active demand for this commodity. Recent price advances by manufacturers accounted for strengthening of stocks on jobbers' parts. Demand for acid-resisting and colored ware shows large increase in this territory, it is reported. Shipments from sources are being effected in satisfactory manner. Makers' prices are unchanged.

Pottery

Wholesalers are well supplied for their existing needs of staple ware. Master plumbers have not as yet experienced any increase in their installations, and movements from distributing points continue to be somewhat irregular. Pottery representatives report that present bookings are somewhat lax but they anticipate a resumption of good business during March and April. As in the case of enameled ware, special pieces help greatly to maintain volumes from week to week. No price revisions have been announced during the past fortnight, the majority of potters having effected their advanced prices in the preceding period. Shipments of staples are undelayed.

Plumbers' Brass Goods

The majority of salesmen in this territory state that their receipts from wholesalers are mostly for immediate needs and that there is very little future delivery business being placed. The average jobber has good assortments on his shelves for the demand which is exemplified by his trade and finds little difficulty in securing replacements when needed. Sales of both cast and tubular goods in general

are not of broad dimensions, for plumbing contractors have not experienced any large extension in their installation work. Makers' prices are generally firm, no revision of note having been received since the last report.

Range Boilers

Contractors' requirements of range boilers continue to show the seasonal quiescence of installation. Wholesalers show no special enthusiasm over their dispositions but are in position, however, to make quick shipments from well regulated inventories. Makers report that their February volumes were just seasonal but that the early spring augurs considerable increase in their sales. Delivery service is excellent.

Boilers and Radiators

While there are no large movements of boilers and radiators from factories or distributing points, consumption demand is sufficiently active to sustain interest in these commodities. Wholesalers' receipts fluctuate from week to week, several reporting good shipments to their trade during the past seven days and others reporting equally good dispositions for the preceding week. Factories and local warehouses of makers are well-equipped to care for present consumption needs.

SOUTHEAST

Total Purchases Are Small—

The plumbing and heating trade in general has shown only a slight interest in future requirements and, according to most reports, is adhering to the policy of keeping stocks pared to a minimum. Little new business developed during the past fortnight and buying is quiet. Contractors are busy primarily with reinstallation and repair work.

Construction activity in the Atlanta area is showing a slight increase, according to reports, and prospective construction for the next several months lends an optimistic outlook. Practically all jobbers in this section have followed the price advance in pottery and enameled ware announced recently by makers, and have changed their quotations to the trade accordingly. In some cases, wholesalers who had small stocks in pottery and enameled ware increased their factory commitments for larger quantities. Deliveries from the makers in all cases are prompt, it is reported.

Soil Pipe

Little new business developed during the past fortnight in soil pipe, according to most reports, and consumption remained on about the same plane. Jobbers placed orders with makers in proportion to their immediate needs. The price situation remained unchanged on the part of makers. Deliveries from the makers are prompt.

Pipe—Brass, Steel, and Wrought Iron

While the volume of brass, steel and wrought iron pipe does not measure up to the proportions of a year ago, according to reports, consumpsumption of these commodities is said to be somewhat greater at present than earlier in the year. Wrought iron pipe moved at a satisfactory rate. Prices on all types of pipe remained unchanged, and mill deliveries are prompt.

Fittings

The movement of the various types of fittings maintained about the same pace as was established two weeks ago, and little new business developed. Master plumbers and heating contractors are engaged largely in reinstallation and repair work. Jobbers are regulating their factory commitments

The Stock Market

Range for Week Ending March 1, 1930†

Par Value	1930 High	1930 Low		*	Weekly High	Weekly Low	Weekly Close
NP	135⅞	118	Air Reduction Sales Co	A	139⅞	125	135¾
NP	38	30⅛	American Rad. & Stand. San. Corp	A	35¾	34¼	35¾
25	100⅞	80½	American Rolling Mills Co	A	96⅛	92	94¾
50	80⅜	69⅝	Anaconda Copper Mining Co	A	76⅛	71¾	75½
NP	38⅛	36¼	Bastian-Blessing Co	C	36¼	36¼	36¼
NP	103¾	92	Bethlehem Steel Co., Com	A	100⅞	97⅜	100⅜
100	127¼	122½	Bethlehem Steel Co., pfd	A	127¼	126⅜	126½
NP	24⅜	13⅛	Brunswick-Balke-Collender Co	A	24⅜	13¼	21½
NP	95⅝	80⅛	A. M. Byers Co., com	A & E	86¾	81⅝	85
100	114	109	A. M. Byers Co., pfd	A & E	112	112	112
100	127½	118	Century Electric Co., com	F	118	118	118
50	4¾	1	Chicago Nipple Mfg. Co., "A"	B	2¼	1	1
50	1½	1	Chicago Nipple Mfg. Co., "B"	B	1	1	1
25	44	42½	Crane Co., com	C	43⅞	42½	43
100	119½	113½	Crane Co., pfd	C	119½	119½	119½
20	21	11½	Eagle-Picher Lead Co	H	15	12¼	13½
NP	39⅜	15⅜	Fairbanks Co., pfd	A	19	18	18
NP	38	34½	Fairbanks, Morse & Co., com	A	39¾	35	39
100	108	102	Fairbanks, Morse & Co., pfd	A	107½	107½	107½
NP	18⅞	12⅛	Greenfield Tap & Die Corp	B	18⅞	18	18⅞
NP	25	22	Iron Fireman Mfg. Co	C	23	22½	23
NP	148⅜	117	Johns-Manville Corp., com	A	139	131½	139
100	122	118¼	Johns-Manville Corp., pfd	A	120	118¼	120
100	120⅞	118½	Jones & Laughlin, pfd	A & E	120⅞	119½	120⅞
NP	75	61	Minneapolis-Honeywell Reg. Co., com	A	69	69	69
NP	60	48	Modine Mfg. Co	B & C	56½	55½	56½
NP	32	26½	Motor Wheel Corp	A	30½	29½	30
NP	42¾	35⅝	F. E. Myers & Bro. Co., com	A	41	38¾	40⅜
100	105	101½	F. E. Meyers & Bro. Co., pfd	G	102	102	102
100	189½	137	National Lead Co., com	A	179	172	179
100	141¼	138⅛	National Lead Co., pfd. "A"	A	140¾	140¾	140¾
100	117⅛	116	National Lead Co., pfd. "B"	A	117⅛	116	117⅛
NP	4½	1¾	National Radiator Corp., com	A	3¼	3	3⅛
NP	11	4	National Radiator Corp., pfd	A	7¼	5¼	7
5	31¼	26	Herman Nelson Corp	B	31¼	28⅞	28⅞
NP	96	69	Ohio Brass Co., "B"	B & G	75½	75	75
NP	29	23	Revere Copper & Brass, Inc., com	A	26¾	23	25½
NP	103	102	Revere Copper & Brass, Inc., pfd. "A"	A	103	102	102¾
NP	19⅝	2⅛	Richmond Radiator Co., com	B	2⅞	2¾	2¾
NP	38⅞	8	Richmond Radiator Co., pfd	B	8	8	8
NP	44½	29	Ruud Mfg. Co	C	29	29	29
NP	31	19⅞	Spang, Chalfant & Co., com	A	28¼	26⅞	28¼
100	96	92	Spang, Chalfant & Co., pfd	A	95½	95⅝	95½
NP	26	24	Time-O-Stat Controls Co., "A"	C	25¾	25	25
NP	94⅜	76	Union Carbide & Carbon Corp	A	92⅞	87⅝	92½
20	33¾	18½	U. S. Cast Iron P. & F. Co., com	A	32⅜	29½	31¼
NP	17¾	15⅝	U. S. Cast Iron P. & F. Co., 1st pfd	A	17	16½	16¾
NP	19	18½	U. S. Cast Iron P. & F. Co., 2nd pfd	A	18⅝	18⅝	18⅝
NP	47⅛	42½	U. S. Radiator Corp., com	B & D	47⅛	46⅛	47⅛
100	100	100	U. S. Radiator Corp., pfd	D	100	100	100
NP	29⅛	21⅛	U. S. Rubber Co., com	A	27¼	25	26⅞
100	53⅜	47¾	U. S. Rubber Co., pfd	A	52½	51	52
100	189½	166	U. S. Steel Corp., com	A	184¾	176⅞	184⅜
100	142⅜	141	U. S. Steel Corp., pfd	A	142⅜	142⅜	142½
NP	5⅜	2¾	Universal Pipe & Radiator Co	A	4½	4¼	4¼
NP	38¼	26	Walworth Co	A	37⅜	35¼	36
NP	14	9	Wayne Co., com	B & C	14	14	14
NP	32½	28	Wayne Co., pfd	B & C	29½	29½	29½
100	110	93	Wheeling Steel Corp., com	B	110	108	110
100	135½	131½	Wheeling Steel Corp., pfd. "A"	B	133	133	133
NP	29¾	16	Williams Oil-O-Matic Htg. Corp	C	16	16	16
NP	134⅞	108	Youngstown Sheet & Tube Co	A	131¼	130	130

*Where listed—
A—New York Stock Exchange
B—New York Curb Exchange
C—Chicago Stock Exchange
D—Detroit Stock Exchange
E—Pittsburgh Stock Exchange
F—St. Louis Stock Exchange
G—Cleveland Stock Exchange
H—Cincinnati Stock Exchange

†If there is no trading during the current week, range represents last week recorded.

A Leading New York Plumber Selects SCOVILL FLUSH VALVES

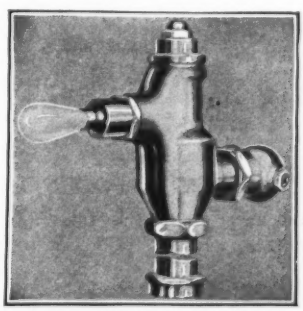
OLDSTYLE dwellings in New York's "famous fifties," many of them more than half a century old, are being replaced by magnificent apartment structures such as 404 East 59th Street, pictured opposite.

Notable for the quality of its construction and equipment, it was logical that the plumbing work should be placed in the hands of Chas. H. Darmstadt, one of New York's leading contractors, and that Scovill "Ampinco" flush valves, notable for their quality construction and perfect performance, should be selected and installed by him.

This is but one of many quality jobs in which particular plumbers have installed "Ampinco" flush valves—and "Ampinco" flush valves are but one item in the Scovill quality line which you should know thoroughly and use frequently to give the utmost value for the money.

If the comprehensive Scovill "Ampinco" catalog is not now in your reference files, send for it at once. No modern plumber should be without it!

404 East 59th Street, New York City. Scovill Flush Valves installed by Chas. H. Darmstadt, Plumbing Contractor, 320 West 43rd St., New York City. Van Wart & Wein, architects.



SCOVILL MANUFACTURING CO.
Plumbers' Brass Goods Division
WATERVILLE CONNECTICUT

A SCOVILL PRODUCT

The Metal Market

	March 4	Average Jan., 1929	Average Nov., 1929	Average 1929
PIG IRON—				
No. 2 foundry, Chicago	$20.00	$20.00	$20.00	$20.00
PLATES AND SHEETS—				
Steel boiler plates, Pittsburgh, per lb.	1.85c	1.90c	1.90c	1.93c
*Blue annealed sheets, No. 13, Pittsburgh, per lb.	2.25c	2.30c	2.35c	2.17c
Black sheets, No. 24, Pittsburgh, per lb.	2.65c	2.70c	2.75c	2.85c
Galvanized sheets, No. 24, Pittsburgh, per lb.	3.40c	3.35c	3.45c	3.57c
TIN—				
Straits tin	46c			
LEAD—				
Chicago	6.20c			

The Old Metal Market
Dealers' Buying Prices

	Per lb.		Per lb.
Aluminum clippings	15 c	Copper, light	13 c
Block tin	36½c	Copper, uncrucibled wire	14¾c
Brass, light	7¼c	Faucets and valves	9½c
Brass, heavy mixed	8½c	Lead, heavy	5½c
Brass, red	11½c	Solder Joints	8¼c
Copper, crucible	15¼c		

NOTE: Prices are those quoted on Tuesday of this week.
* Comparisons are with old blue annealed base, No. 10.

commensurate with the demand from contractors, and are maintaining small but good working stocks.

Enameled Ware

As a result of the recent advance in enameled ware it is reported that some jobbers slightly increased their factory commitments for later delivery. Demand from contractors remained seasonal on staple items. Jobbers are fairly well stocked in regular ware and are prepared to meet current demands from the contractors.

Pottery

Wholesalers appeared more interested in entering the market for future needs in pottery since the announcement of the price advance noted in our review of February 22, according to reports. In general, local wholesalers have a low but well-assorted supply on hand.

Plumbers' Brass Goods

Consumption of plumbers' brass goods was seasonally low and wholesalers, it is reported, are reluctant to place large orders with makers, preferring to keep only average working stocks.

Range Boilers

Range boiler movement into trade channels continued light and most wholesalers state that business is only fair in this line. Most disbursements are going for replacement work and little new business developed in the past two-week period.

Boilers and Radiators

Most jobbers interviewed stated there was a decline in boiler and radiator business for the past fortnight, although business is about at the level prevailing a year ago at this time. The early spring weather is having its effect on the heating lines in this section. Replacement work is in fair demand and constitutes a large portion of the activities of contractors.

PACIFIC COAST

Coast Business Holds Fair Pace—

General business along the Coast continues to be of a moderate nature with conditions better in some sections than in others. Generally speaking, business is not as active as last year at this period. Distributors as a rule have good stocks of all classes of material, and the trade's needs are being taken care of without delay. Distributors' prices to the trade as a rule are holding firm.

Soil Pipe

Little if any increase in the demand for soil pipe has been noted during the past few weeks, the trade continuing its policy of purchasing only in small lots for immediate needs.

Pipe—Steel and Wrought Iron

Steel pipe continues to move in moderate volume with the trade purchasing mostly for current needs only which are not heavy at present. Distributors of this commodity on the Coast are carrying well-balanced stocks and the trade is not having any difficulty in securing material. Prices remain unchanged.

Fittings

Little if any increase in the demand for malleable, cast iron screwed or drainage fittings is apparent at the present writing. Most of the trade is purchasing only in small lots for immediate use or to sort up stocks.

Enameled Ware

The recent price advance announced by most manufacturers has been reflected by most Coast distributors in their quotations to the trade and resulted in quite a few orders being placed to cover contracts previously secured.

Pottery

A steady although not heavy demand for pottery continues. Most purchases, however, continue to be in small lots for immediate requirements. Distributors generally have good stocks and can also secure prompt shipment from Coast potteries.

The Modern Salesman

(Continued from Page 64)

tive two hundred and fifty dollar gamble. It worked well.

The game of selling had been going too smoothly not to have a "back fire," and it happened when "Eliza" came on the scene. Apparently the sight of that washing machine was "handwriting on the wall" to her extra day of work in that household.

Now, "Eliza" is a more difficult problem than the Browns. Because she is only the laundress does not detract from the influence she can exercise with Mrs. Brown. She "knew her line" too when she said the machine would tear the clothes. Not that it would, but fear that it would could destroy this sale, and Jones knew it too. He didn't lose any time getting the machine filled with water and clothes and going.

We don't suppose Jones ever did an actual washing with a machine in his own home; but evidently he had watched it in operation, observed the manner of preparing the water and clothes so that he knew just how it should be done. Very important, indeed.

Jones exhibited extreme tact in fading out of the picture for the time to finish the first batch of clothes. To have remained there might have developed too much talky-talk, and there is such a thing as talking too much.

His lesson is outstanding. Know your merchandise as the manufacturer who built it and as the one who will use it will come to know it. Then you can discuss it intelligently, in language comprehensive to your prospect.

Why Not Sell MYERS SELF-OILING A REGISTERED TRADE NAME POWER PUMPS?

The Line With More Sales Opportunities

FIG. 2426

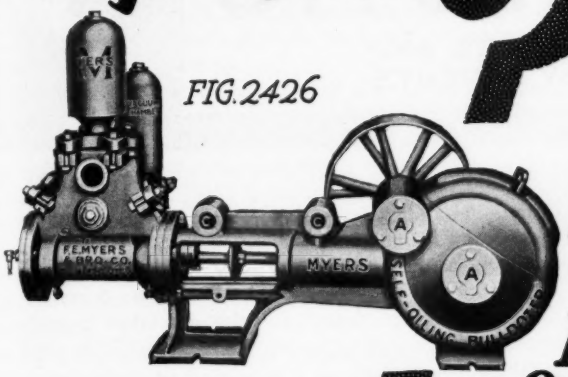


FIG. 2455

FIG. 2551

FIG. 2527

FIG. 2549

YOUR power pump business rests on the line of power pumps you have to offer to your trade. Dealers the land over have found it to their advantage to reach out in every direction for more power pump business with Myers Self-Oiling Power Pumps.

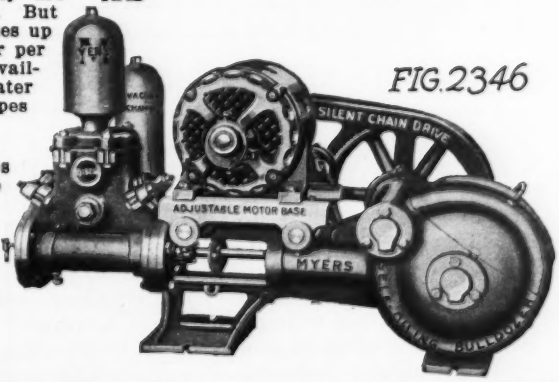
A home owner living beyond the web of city water mains may be a live prospect for a water system—a nearby farmer may be looking around for suitable equipment to modernize his home and farm buildings with running water—A centralized school, a rural church, a service station, a creamery or dairy or any one of a hundred other prospects may be ready and waiting for someone to sell them modern water facilities.

Myers Self-Oiling Power Pumps and Water Systems open a broad highway to this business—a highway that is paved with superior quality and protected at every turn with national publicity—a highway with leads in every direction permitting wider sales activities and greater returns than can possibly be obtained with other lines restricted to but a few types.

Shown here are six leading styles. They are popular because they are the sizes in greatest demand. But other styles of equal merit in sizes up to ten thousand gallons of water per hour are equally successful and available for those who use more water than can be supplied by smaller types of pumps.

Stock Myers Self-Oiling Power Pumps and plug the gaps in your power pump business. Write or wire.

FIG. 2346



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PUMPS · WATER SYSTEMS · HAY TOOLS · DOOR HANGERS

PUMPS FOR EVERY PURPOSE - WATER SYSTEMS - HAY TOOLS - DOOR HANGERS

Questions?

ASKED BY READERS AND ANSWERED BY EXPERTS

Septic Tank Does Not Operate

EDITOR, DOMESTIC ENGINEERING:—I have a plumbing job in the country concerning which I wish you would give me some advice. It is the first job in eleven years that has failed on me.

I am giving you a diagram (Fig. 1) of the job, and I think the trouble comes from lack of air.

The septic tank never has had the bacteria working in it. The sewage runs into the tank, paper comes to the top, solids settle to the bottom. The whole system has become clogged.

Will the tank work if I take out the trap and vent the septic tank?

Iowa. W. I.

A watch or an automobile must be set up correctly in order to render satisfactory service. It is exactly the same way with a septic tank.

There would seem to be several things wrong about this job, and they are of such fundamental nature that from the time it was installed there has been no question of its failure.

Omission of the trap and venting of the septic tank as proposed by our correspondent, have nothing to do with the failure however. As a matter of fact, the bacteria on which the action of the septic tank depends, thrive in the absence of air, and therefore it would be wrong to vent the tank.

The sketch that has been supplied is not clear to us in several respects, and we are not sure that Fig. 1 represents the layout exactly according to the original job. We think the essential features are correct, however.

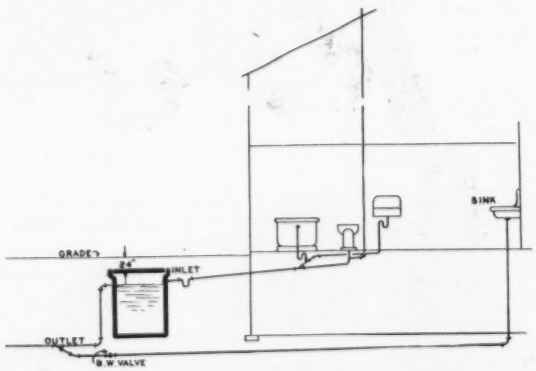


Fig. 1

In Fig. 2 we have shown another layout, incorporating several features of improvement over the original work shown in Fig. 1. In our judgment the greatest defect is in the inlet and outlet to the septic tank. Our opinion is that wrong installation at these two important points is the cause of the failure of the tank. Our correspondent states that the bacteria have never become operative in the tank, and the reason for this condition is entirely clear.

When the bacteria in the septic tank refuse to act, much of the solid matter entering the tank in the sewage from the house passes out of the tank into the sub-surface irrigation disposal system, and after a time this system becomes clogged. The function of the bacteria

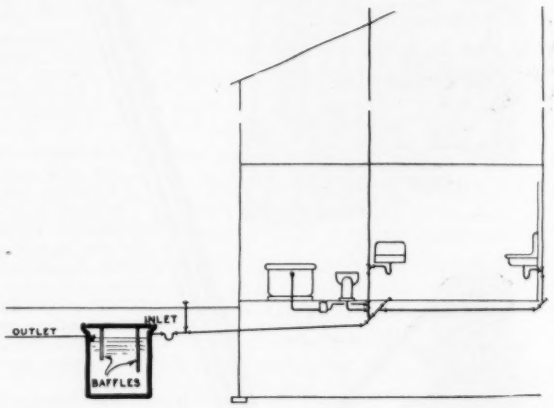


Fig. 3

in the septic tank is to liquefy a very large part of the solid matter entering it, in which shape it is ready for final disposal into the sub-surface system.

The entire action that goes on in the septic tank depends on these bacteria. This type of bacteria is known as anaerobic bacteria, in distinction from the aerobic bacteria which are found in sandy soils, and which depend for existence on the presence of air.

In order then, that the septic tank may become operative and may so continue, these bacteria must be given every possible means of living and multiplying.

These bacteria attack the solids which settle in the septic tank, turning them into gas and into liquid. The gas thus liberated, in rising to the surface of the sewage standing in the tank, carries upward small particles of material, which after a time forms a thick scum on the surface of the sewage. This scum or crust is several inches thick.

In this crust the bacteria live and breed, and it becomes of the greatest importance to the correct operation of the septic tank that this breeding place be left absolutely undisturbed. If the crust is broken up and carried out

of the tank, the efficiency of the tank is gone, and its operation will be seriously affected until the scum or crust forms again.

Reference to Fig. 1 will show that sewage from the house enters the tank at a point above the surface of the liquid. This means that the scum will be constantly disturbed and broken up.

Furthermore, the outlet is from the top of the tank, allowing the crust or scum to pass out as it breaks up.

As we have already stated, under these conditions, it is entirely impossible for the septic tank to function.

The remedy for this is to turn the inlet and outlet pipes down into the tank, to points well below the under surface of the scum.

Fig. 2 shows this same result obtained by means of baffles placed at the inlet and outlet, and extending across the tank.

This difficulty that we have been discussing however, does not seem to be the only wrong thing about this system.

In Fig. 1 the outlet from the tank drops to a point about on a level with the bottom of the tank, and as the top of the tank is about two feet down from the surface of the ground, it is clear that the effluent from the septic tank must be discharged into the sub-surface disposal piping at a level several feet below the surface.

It is a well-known fact that the bacteria which act on the effluent from the septic tank after it has been discharged into such a disposal system, depend on frequent supplies of air for their existence. It will be clear, therefore, that such bacteria will naturally thrive and breed most abundantly in soil close to the surface, where air will reach them more effectually than at lower levels. As a matter of fact, after a depth of a foot or so, the numbers of these bacteria rapidly decrease, until at 5 ft. below the surface, they almost cease to exist, at least they are very ineffective at that level.

This means that when a septic tank discharges its effluent to such a low level as in Fig. 1, the sub-surface irrigating system cannot possibly operate efficiently, and this results in time in the clogging of this system.

With the septic tank itself inactive and with the poor results bound to be obtained from the final disposal, there is no wonder whatever, that this entire plumbing and disposal system has become a failure.

It may be interesting to know something about the action that takes place in sub-surface sewage purification.

Contrary to the belief of many, the septic tank does not purify the sewage that it handles. The sewage that leaves the septic tank is as impure as when it first entered the tank.

What the septic tank actually does is to reduce the solids to liquids. So effectual is this bacterial action that after a time even such solids as bones are liquefied.

The action that is performed by the aerobic bacteria in the soil is of a different character however. These bacteria actually attack the impurities found in the septic tank effluent, and reduce them to chemical forms that are suitable for plant life to live upon.

However, aerobic bacteria need periods of rest in which new supplies of air can reach them. For that reason, better results can be obtained from a septic tank which discharges intermittently through an automatic siphon than from a tank that discharges by overflow.

One of the remarkable things about sub-surface dis-

A FEW DOLLARS MORE

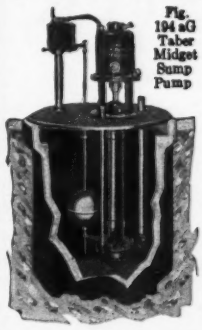


Fig. 194 aG Taber Midget Sump Pump

YOU sell, or ought to sell, satisfactory cellar drainage . . . protection from water damage to merchandise or goods stored in the basement . . . when you sell a sump pump installation.

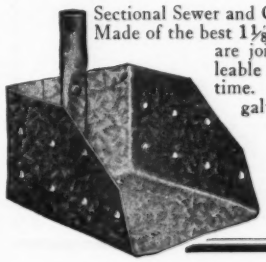
Why permit a few dollars to stand in the way of 25 years of satisfactory service rendered by the Taber Midget Sump Pump? Write for description and prices. See page 923, Domestic Engineering Plumbing and Heating Catalog.

TABER

TABER PUMP CO. *Est. 1859*

290 Elm Street, Buffalo, New York

COLEMAN'S



Sectional Sewer and Conduit Rods in 3 or 4-ft. length. Made of the best 1⅛-inch second growth hickory and are joined by the most improved malleable iron coupling. Will serve a lifetime. Coleman's Basin Dip is of heavy galvanized iron, durable, reasonable.

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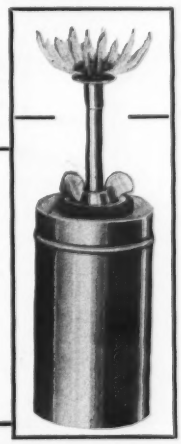

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Here is a light that will save you time and money. It gives eight times the light of a candle and will not blow out or drip wax. Holds enough gasoline to burn from two to four hours.

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TANKS FOR: High pressure gas and air storage—Pneumatic water systems—Gasoline and oil storage—Oil burning equipment—Open top—Welded. ATSCO Genuine Copper Brazed tanks for high pressure—the tightest, safest, strongest tank it is possible to construct by any known process. A.S.M.E. code tanks.

THE CHESTER

New Design China Lavatory

This new lavatory has many decidedly advanced sales features. It is equipped with accessory holders, has a FRONT overflow and only extends 15 inches from the wall although allowing full size 10 x 15½ inch basin.

Can be furnished without tooth brush openings if desired.

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Features of Safety

In this enterprising Northwest metropolis no building will serve its tenants more efficiently. Halsey Taylor fountains have been installed because of their features of safety, assuring maximum sanitation and convenience in a building.

The Halsey W. Taylor Co., Warren, Ohio.

Automatic Stream Control

A practical and exclusive feature that keeps stream at correct drinking height at any pressure.

HALSEY TAYLOR DRINKING FOUNTAINS

posal systems is that in severe cold weather the tile pipe composing the system will not freeze up, provided warm sewage is discharged in the ordinary manner into the septic tank.

◆

Wants Remedy for Sweating Walls

Editor, DOMESTIC ENGINEERING:—I have a problem which I would like to ask you to solve. It is a ventilating problem in two homes where the walls are sweating. One home is a frame structure while another one is a brick structure. The plaster was applied to the brick, making a wall with no air space. I am installing ventilators on the roof and registers in the ceilings to overcome this condition, but would like some information on what causes the sweating condition and how I can overcome it. Any information as to what causes it will be appreciated. Both the homes I speak of are burning gas which probably has something to do with the sweating condition.

Oklahoma. G. O.

The sweating is due to the fact that moisture in the room comes directly in contact with a cold wall; if there were an air space in the wall, this condition would not result.

The moisture may come from cooking utensils, the water used in the laundry, or the water used in humidifiers on radiators or in moist air furnaces.

Then, too, there is a tendency for certain types of gas burning heaters to consume the oxygen in the air and this results in the condition mentioned.

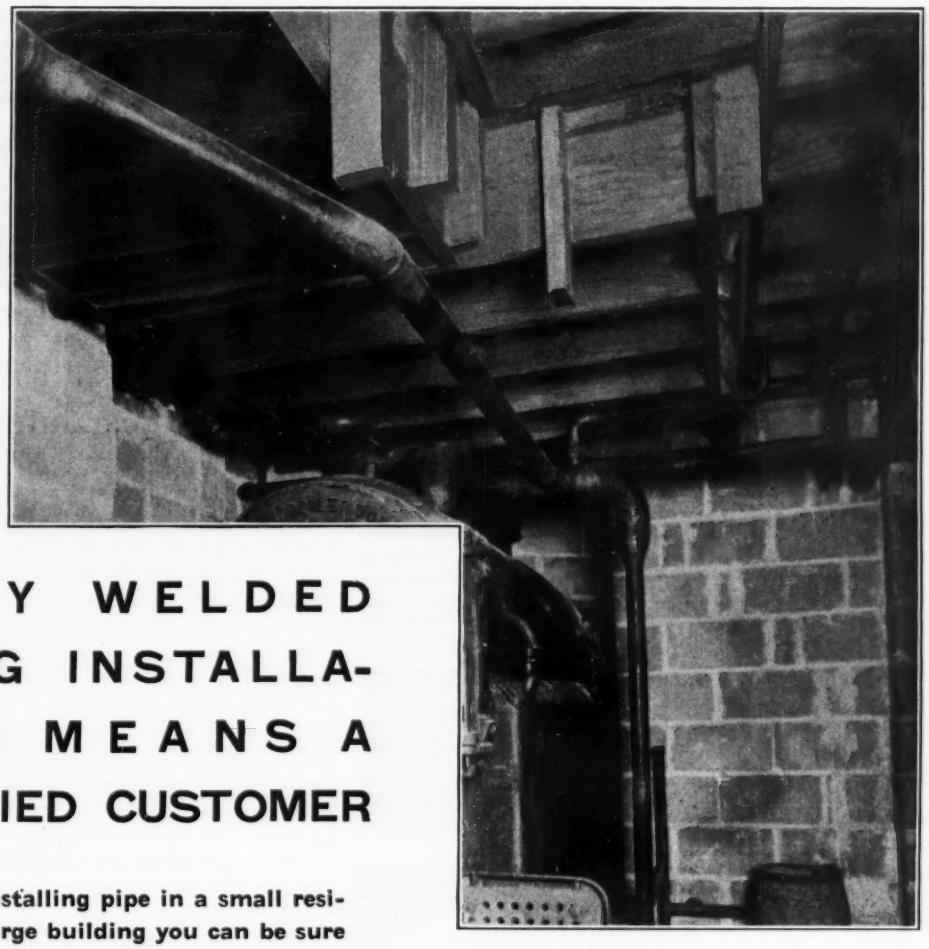
The installation of ventilators and registers may help, but the installation of wall board or plaster, with an air space, would be better.

The V-5—Plumbing in a Cruiser Submarine

(Continued from Page 78)

tion as the operation of a water closet which is described below. The capital letters refer to Fig. 4.

Sea water for flushing is admitted to the bowl by opening valve A. Waste is dumped into the waste receiver by opening the flapper valve at the bottom of the bowl. This flapper valve is ordinarily held against its seat by a counterweight connected to the valve shaft. With the stop valve C open, compressed air admitted to the waste receiver will firmly seat the flapper valve and force the contents of the waste receiver overboard. Air for operation of the closet is supplied from a small volume tank located in the water closet space. Small sea pressure gauges and also gauges showing the pressure in the volume tanks are fitted near the tanks. Operation of the lever of the three way valve D in one direction admits compressed air to the volume tank. Movement of this lever in the opposite direction shuts off the air supply to the volume tank and connects the volume tank to the waste receiver. Instruction plates are provided in all water closet spaces on which are shown the necessary instructions for operation of the closets and which direct that the pressure to which a volume tank shall be charged shall not exceed the sea pressure as shown by gauge by more than 10 pounds per square inch. This direction



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Because—a joint, properly oxyacetylene welded is as strong and permanently free from leaks as the pipe itself.

And the conveniences and flexibility of this method of installation is unequalled by any other.

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90 Plants
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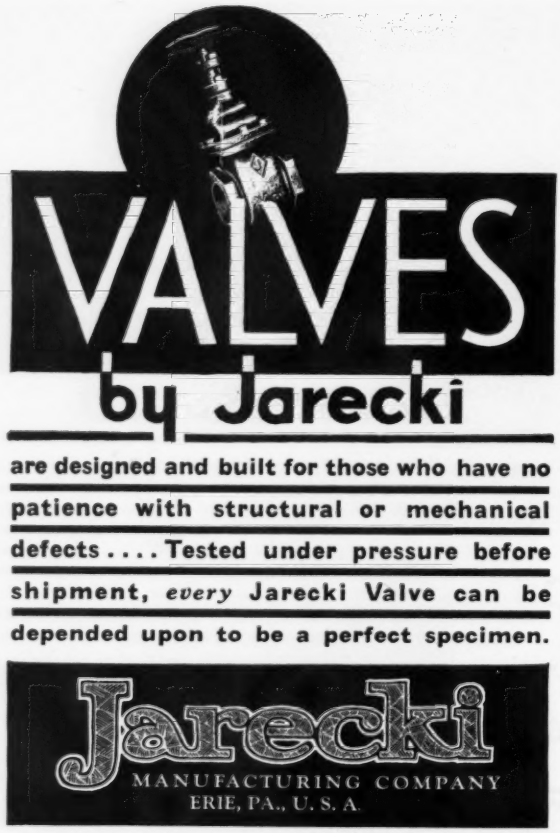
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are designed and built for those who have no patience with structural or mechanical defects.... Tested under pressure before shipment, every Jarecki Valve can be depended upon to be a perfect specimen.
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THE KAINER PRESSURE GOVERNOR
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for Hot Water Heating Systems
—Reduces the cost of a hot water layout.
—Eliminates expansion tank and fittings (with its danger of freezing and overflowing).
—Simplifies installation—makes a better job.
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is included in order that the water closet system shall not be subjected to pressures in excess of that which it is designed to withstand.

A garbage ejector which operates on the same principle as the above described water closet is installed in the scullery for the disposal of refuse when operating submerged.

From the above description it will be noticed that what might be called the domestic facilities aboard the modern submarine compare very favorably with such facilities in surface craft when the limited space available in the undersea boats is taken into consideration.

Conversion of a Vapor System into a Vacuum-Vapor Job

(Continued from Page 47)

the water back into the boiler until the level in the return trap was 12 inches above the level in the boiler. This differential pressure of 12 to 16 inches of water between the feedlines and the return figures from 6 ounces per square inch to 9 ounces. Such pressures were ample to secure good distribution. When the thermostat shut off and the fire receded, the vacuum continued to grow until it reached 15 to 20 inches of mercury. Under such conditions the differential pressure dropped to a value of 3 to 4 inches of water. A manometer tube filled with water was connected across from the boiler to the return line so as to show the difference between the boiler and the return pressures. It was found that a minimum differential pressure of 3¼ inches, water gauge, was required in order to get steam to the far radiators. This is equivalent to 1.6 ounces per square inch. Incidentally, it is this differential pressure that means circulation, irrespective of the amount of vacuum on the boiler. Experimentally the boiler was operated at the lower vacuums of 2 to 6 inches of mercury. It was found that the differential pressure frequently dropped to 1½ to 2 inches of water—too low for good circulation. The reason for this is shown in Fig. 4. Note that at 20 inches of vacuum the volume of steam is 290 per cent greater than at atmospheric pressure. Another way of stating it is that the same heat put in the boiler operating at 20 inches vacuum gives approximately 2½ times as much steam as at low vacuum. The heat content per cubic foot of steam is 14 B.t.u. at 20 inches of vacuum as compared to 43 units at atmospheric pressure. This large volume of steam obtained even with banked fires means good distribution of heat as shown by the greater differential pressures, and, after all is said and done, the whole purpose of the system is to distribute heat. Its efficiency can be measured only by the effectiveness of distribution. Desirable fuel economy is a secondary result of uniform distribution, but there are so many other factors entering into fuel economy such as method of firing, the design of the boiler, insulation of the building walls, tightness of windows, that it is impossible to rate the system solely upon fuel economy. On the other hand, the uniformity of distribution is a definite tangible method of determining its efficiency.

In operating this system, it was found impossible to get away from short circuiting of the steam through the nearby radiators, except by throttling down their valves.

This happened particularly in mild weather and occurred even at high vacuum. Such short circuiting was accompanied by a reduction of the differential pressure which explains the resulting spotty distribution. An adjustment to accomplish this balancing effect that operates in one kind of weather will need changing in a different kind of weather.

The pump used on this system handled about ½ cu. ft. per minute. It was driven by a 1/6 h. p. motor. It operated about ½ hour per day. The pump was not equipped with a receiving tank as is customary. It was placed about 2 ft. above the water level of the boiler and the pipe was sloped away from it so that moisture would not drain into the pump.

To Find the Net Profit

(Continued from Page 45)

(excluding office salaries, which, as explained above include part of owner's drawings). On the other hand, our western plumbers pay more rental than we do.

We agree with our New England friends that there would be a good living for one, out of a business doing $30,000 a year. An increase to $60,000 will not materially increase the overhead expense, so that there should be ample margin for increased profits, and more liberal drawings by the partners.

We are very glad indeed to get these statements, and the more we receive, the better shall we be able to arrive at some kind of standard upon which to base fairly accurate conclusions as to what is happening in the plumbing and heating industry.

◆

Brooklyn Association Installs New Officers for 1930

At the regular semi-monthly meeting of the Master Plumbers' Association of Brooklyn, N. Y., on January 23, new officers were installed as follows: Harry Voletsky, president; J. Louis Bosch, vice president; John J. Dixon, treasurer; Henry D. Jost, financial secretary; Thomas H. Pinnell, recording secretary; Patrick F. Halloran, marshal, and Abraham Cohn, sergeant-at-arms.

◆

Clifton, N. J., Masters Install Officers at Banquet

The Master Plumbers' Association of Clifton, N. J., recently held its annual banquet and installation of officers at the Visentin Country club. A. C. Krieger, president of the state association, conducting the ceremony, installed M. J. Dericks, president; Peter Tizianni, vice president; Louis Weigele, treasurer; F. Bilowith, secretary, and S. L. Salko, sergeant-at-arms.

The trustees obligated to serve during the year are C. W. Hooyman, F. Garland and T. W. Wasniewski.

George Van Varick presided as toastmaster and presented President Dericks and Secretary Bilowith each with a gift from the association. During dinner he introduced State President Krieger, State Secretary W. T. J. Orriss, President Dericks, George Brenner, president of the Orange association; Mrs. W. T. J. Orriss, president of the state auxiliary; Mrs. Charles Zimmermann,

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The reason so many drainage jobs are forgotten is because they are equipped with SEMLER Fittings. With Semler Fittings on the job there is no occasion to remember them.

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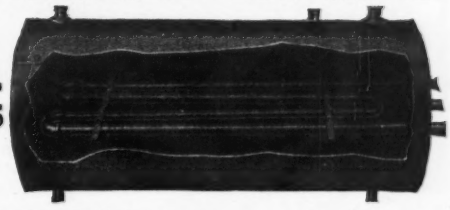

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THE NOVELTY STEAM BOILER WORKS COMPANY
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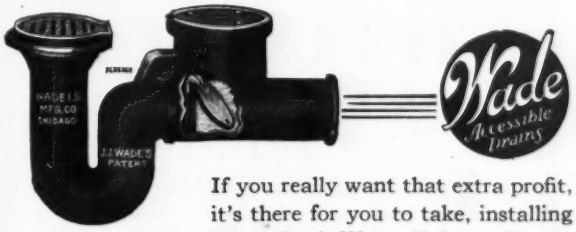

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BACK of this "Lynchburg Service" we love to talk about, are huge stocks of Cast Iron Pipe, Fittings and Flanges in all standard sizes —ready for immediate shipment. "Lynchburg Service" steps up and makes your piping jobs more profitable.

When you need a Fitting *quick*, wire Lynchburg.

Bell and Spigot Pipe and Fittings from 4" to 48"

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General Office, LYNCHBURG, VA.

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342 Madison Ave. NEW YORK, N. Y.

secretary of the state auxiliary, all of whom addressed the gathering briefly. Delegates from the North Hudson, Orange associations and auxiliaries were present to enjoy the banquet and dancing which followed.

◆

Illinois A. S. H. V. E. Holds February Meeting

At the February meeting of the Illinois Chapter of the American Society of Heating and Ventilating Engineers, 109 members and guests were present at the Sherman hotel in Chicago. The speaker of the evening was Homer R. Linn who discussed the "Present Status of the Oil Burner."

Thirteen or fourteen years ago, according to Mr. Linn, the oil burner was introduced in Chicago. As an indication of the growth of the industry, it was pointed out that in 1927 there were in operation, in homes, 97,500 burners for domestic purposes. On January 1, 1930, it was estimated that there were 517,000 domestic oil burners in successful operation. Further indications of progress were brought out in stating that in 1921, there were 7,500 natural draft burners and 5,000 mechanical draft burners while in 1926, there were 113,900 mechanical draft burners and only 56,500 natural draft burners. Also, bureau of mines statistics were quoted

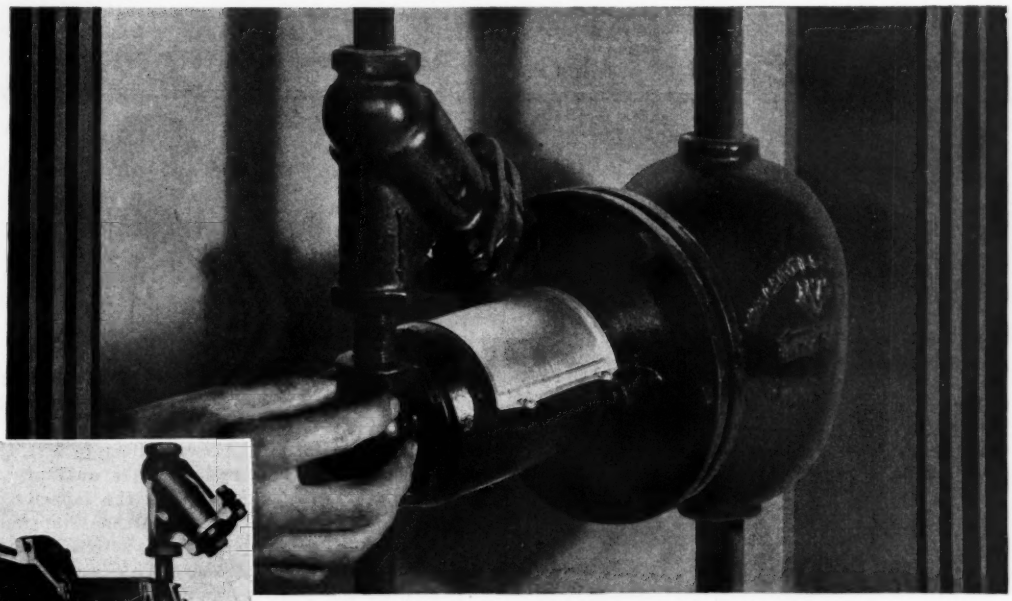
John J. Aeberly **L. A. Snider**
New Members of Illinois Chapter, A. S. H. V. E.

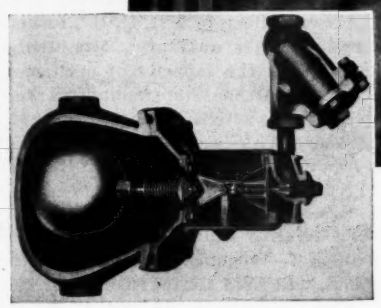
showing that during the winter of 1921-22, 500,000 bbls. of oil was consumed and during the winter of 1925-26, 6,850,000 bbls. of furnace oil and 1,970,000 bbls. of heavy oil was burned.

The discussion then turned to the subject of trouble jobs and Mr. Linn stated that the new specifications for fuel oil will eliminate a great amount of oil burner trouble as they become more universally adopted.

One of the main sources of trouble is found in the chimney. Instances of this were cited, one story telling of a recent trouble job having an offset chimney. A smoke test was applied and it was found that a piece of tile had lodged in the offset. According to the speaker, you may be suspicious of all offset chimneys on trouble jobs. Another experience illustrated difficulties encountered with leaky chimneys. Also, dirty water in the boiler causes a considerable proportion of the oil burner troubles.

H. C. Mueller of Powers Regulator Co., Chicago, and D. G. Malone of Hardin-Lavin Co. were elected to membership in the organization.





Note that the float and genuine sylphon bellows are the only parts in the float chamber. All operating parts are outside.

"So that's why the valve never fails!"

You don't have to *assume* that the McDonnell No. 30 Safety Feeder is as far ahead of other single valve feeders as the M & M Duplex is ahead of other duplex feeders—you can *prove* it.

Make this test yourself—

First make sure that the water level in the boiler is above the arrow on the float chamber. With the water level in this position the entire feeder becomes as hot as the boiler can make it because no city water is passing through the feed valve. Then place your hand on the feed valve and notice that you can allow it to remain there indefinitely. At the same time you'll find that the float chamber is so hot that you scarcely dare to touch it.

That is what we mean by a *ventilated and isolated feed valve*—a feature that places the No. 30 Feeder in a class all its own. Where there is no appreciable heat—there can be no scale formation—and where there is no scale, there is no chance of seizing or sticking of the valve, particularly a valve of McDonnell & Miller construction.

Remember that the McDonnell No. 30 Feeder is to the smaller job all that the McDonnell & Miller Self-Cleaning Rotary Valve Duplex Feeder is to the medium and larger boiler.

This means that it opens up an enormous market for you. It brings McDonnell & Miller certainty to the smaller job at a price that the owner of the smaller installation is willing to pay.

Let us show you how you can build up goodwill and make some worthwhile extra profits out of the McDonnell & Miller proposition. The coupon brings facts about a business-building plan that has been tested and proved by hundreds of contractors. Mail it now, before you forget!

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400 N. Michigan Ave., Chicago, Ill.
Please send facts about your proposition to:
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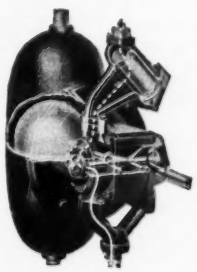

For medium and large boilers

The McDonnell & Miller No. 28 Self-Cleaning Duplex Feeder is the accepted standard of feeder quality. Its self-cleaning rotary valves, fully adjustable differential between valve openings, and adjustable water levels, set it distinctly apart from all other duplex feeders. Ask for special bulletin describing the No. 28 Feeder.

McDONNELL & MILLER
Boiler Feeders

"Doing one thing well"

Woman's Page

An interesting activity carried on by women is that of the Illinois Home Bureau Federation. This bureau is an organization of home makers, principally rural women, who are improving their homes, in order to have them approach as near as possible to the ideal. According to Mrs. Pearl M. Reifsteck, who is in charge of the bureau's campaign to put running water in every farm and rural home, a survey shows that running water is desired by farm women more than any other convenience which may be introduced into the home. Committees have been set up over the state in order to interest as many women as possible in this project.

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Ohio State Auxiliary Holds Convention at Springfield

The eleventh annual convention of the Ohio State Ladies' Auxiliary was called to order by the president, Miss Alma Niesen, in the auditorium of the Eastern Star Temple, Springfield. The meeting was opened with prayer by the chaplain, Mrs. D. J. Ahearn. Mrs. Herrier, of Springfield, presented the president, Miss Alma Niesen, with a beautiful basket of flowers. In behalf of the Cincinnati auxiliary, Mrs. George Biedenbach presented the president, Miss Alma Niesen, and the secretary, Mrs. Charles A. Woelfel, each with a beautiful flower bowl. A few words of welcome were given by Mrs. H. L. Crockett, president of the Springfield ladies' auxiliary. Mrs. George Doench of Cincinnati acted in the capacity of parliamentarian. The locals throughout the state submitted very interesting reports of their activities throughout the year, and these were heard with interest by all. A brief talk on the scholarship fund was given by Mrs. Stanley Smith of Columbus.

Michigan Auxiliary Makes Plans for Convention

The Women's Auxiliary to the Michigan State Association of Master Plumbers will hold its fourth annual convention in Jackson, Mich., March 25, 26 and 27, at the Hayes Hotel. The auxiliary is planning on a one hundred per cent attendance, and the state president, Mrs.

A Message to Auxiliary Members

By Mrs. Charles D. Kieser of Newton Center, Mass., president of the Women's Auxiliary to the Massachusetts State Association of Master Plumbers.

In April, 1926, I had the honor of being elected president of the Women's Auxiliary of the Newton Master Plumbers' Association. This position I held for two years, with every member willing and ready to help at all times. My vice president was always a great help also, and when two women work together for two years, without any friction at all, it is very gratifying.

Our locals have done much charity work, as well as being a help to members in planning good times.

In April, 1928, I was still more highly honored by being elected president of the Women's Auxiliary of the Massachusetts State Association of Master Plumbers. I felt as if I could never fill this position, but by the co-operation of all the members, I think I have accomplished something. If all auxiliary members co-operate as willingly as those in the Massachusetts auxiliary, we will never have any complaints.

My officers have been all that one could desire, always ready and willing to help. Last year we earned our scholarship fund. This year we hope to do our share to help at the national convention when it comes to Boston in June.

M. Mesnard, is anticipating the co-operation of each local and every member to support this. The Detroit auxiliary is having a beautiful star quilt made, with the star points to be in the rainbow colors. This quilt will be sold at the convention, the proceeds to go to the state treasurer for the purpose of carrying on the work.

New President of Wisconsin Auxiliary Sends Greetings to Members

The following words of greeting have been received from Mrs. John Feiner, of Racine, newly-elected president of the Wisconsin State Auxiliary:

As my official term has begun, I take this opportunity to thank you for the honor you have bestowed on me, by electing me your state officer.

I sincerely trust I may measure up in every way to the confidence you have placed in me, and let me assure you that I will take a personal interest in each auxiliary, and its members, and that I am at your service at all times.

North Shore Auxiliary Holds Annual Banquet

Another delightful social affair was held on Saturday night, February 8, by the Woman's Auxiliary to the North Shore Plumbing Contractors' Association. The occasion was the annual banquet and dance, held at the Georgian Hotel, Evanston. Reservations for one hundred and sixty members were made, and a five-course dinner, to which all did justice, was served. Balloons, inflated and tossed from one table to another, furnished a source of amusement to all.

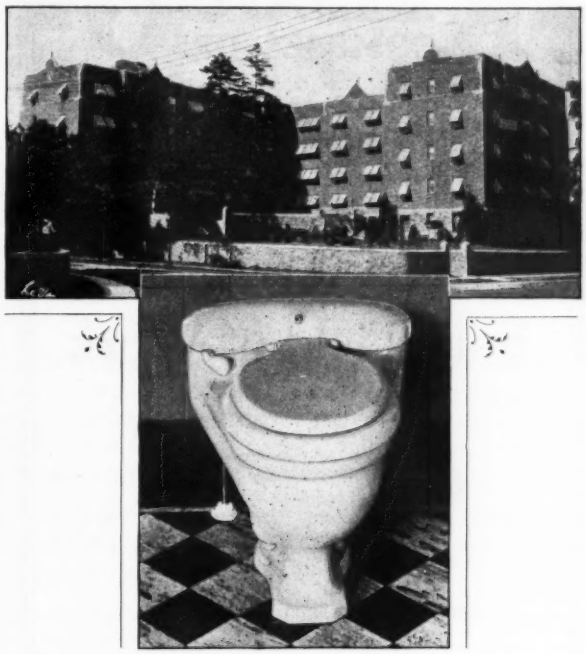
Miss E. Schmeisser, retiring president of the auxiliary, introduced the toastmaster, N. J. Mergenthaler, who in turn introduced the incoming president, Mrs. George Swift; the vice president, Mrs. N. J. Mergenthaler; the secretary, Mrs. Julia McKenna, and the treasurer, Mrs. Alex Kyle. The president of the North Shore Plumbing Contractors' Association was then introduced, also Henry T. Strenger and William F. Hildeman, past presidents of the Illinois Master Plumbers' Association; C. A. Bolton, secretary of the Illinois Master Plumbers' Association, and R. J. Weber, president of the Plumbing Contractors' Association of Chicago.

The auxiliary presented Miss Schmeisser with a beautiful beaded bag, at the conclusion of the dinner, as a token of esteem and appreciation for services rendered. Each of the incoming and retiring officers was presented with a fitting floral tribute. After dinner, dancing was enjoyed until midnight. A vote of thanks was extended to the committee for making this affair such a success. All felt that special appreciation should be given to the retiring president and her board of directors. Miss Schmeisser accepted the honor bestowed upon her two years ago reluctantly, knowing that she was the youngest member of the organization. It did not take long, however, for the members to realize how wisely they had chosen, for Miss Schmeisser proved herself efficient in every detail. Mrs. Swift, vice president; Mrs. Wood, secretary; Mrs. Kyle, treasurer, were also extended thanks for their loyal support and co-operation.

North Hudson Auxiliary Gives Card Party

The Women's Auxiliary of North Hudson, N. J., gave a card medley on the evening of Lincoln's birthday, at Wiesberg's Hall in West New York. There were eleven tables of bridge, pinochle and bunco. Mrs. Charles Zimmerman, chairman of the entertainment committee, was assisted by Mrs. William Borg, Mrs. Charles Steller, Mrs. Edward Muth, Mrs. Edwin Sietz and Mrs. Vincent Farrelly. Refreshments were served by the refreshment committee

Sun Haven Apartments, New Rochelle, N.Y., O. W. Kritz, Architect, W. F. Beisler, Plumbing Contractor.



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EXCLUSIVE T/N features appeal to everyone, everywhere! Modern beauty in a stream-line construction . . . modern one piece simplicity . . . modern quietness in T/N's silent flushing action. These points mean profitable sales. Suggest T/N for your next job, whether it be a new home or a replacement. You'll have a pleased customer.

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Get a line on T/N . . . find out about T/N profits . . . write us for name of your nearest jobber.

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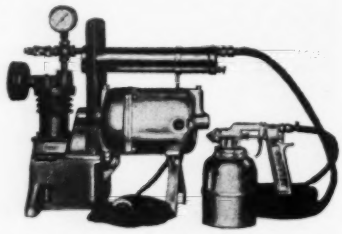

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The pressure feed cup gun handles a wide variety of materials and is easily controlled as to both quantity of fluid and degree of atomization.

This outfit is extremely useful for painting heating plants, radiators, steam pipes, and other objects that cannot be moved readily.

Furnished complete with compressor, motor, pressure cup gun, and 15 ft. 1/4" air hose.

Ask your dealer or write us for complete information.

KELLOGG MFG. CO.
121 Humboldt St. Rochester, N. Y.

—Mrs. Daniel Thurnau, chairman, assisted by Mrs. Chris. Werner and Mrs. Edward Witteriech. The next affair of importance is the masquerade and dinner to be held at the Elks Club in Union City on March 8. Ten prizes will be given for costumes.

North Shore Auxiliary Holds February Meeting and Luncheon

The February meeting of the Women's Auxiliary to the North Shore Plumbing Contractors' Association was held Thursday, February 20, at the residence of Mrs. A. J. Chester, Evanston. A most delicious luncheon was served at one o'clock. The business meeting was called to order by the president, Mrs. George Swift. Twelve members answered the roll call. Many important topics pertaining to the welfare of the auxiliary were discussed. The usual card-playing was omitted.

Portland, Ore., Auxiliary Elects Officers

Mrs. George W. Kendall was elected president of the Women's Auxiliary of the Portland, Ore., Master Plumbers' Association at the annual luncheon-meeting held in February at the home of Mrs. T. J. Rowe. She succeeds Mrs. L. A. Beard. Mrs. W. Earle Parker was elected vice president; Mrs. William T. Finnigan, secretary, and Mrs. T. J. Rowe, treasurer. Mrs. Finnigan will be hostess at the next meeting to be held at her home on March 19. Mrs. Kendall, who is a member of the board of trustees of the National Auxiliary, expects shortly to visit several towns in the state in the interests of the national scholarship fund.

Oklahoma City Auxiliary Elects Officers

The Woman's Auxiliary of the Oklahoma City, Okla., Master Plumbers' Association held its first meeting of 1930 at the home of Mrs. K. G. Brandt, 1217 West Thirty-first street. Officers for the ensuing year are as follows: President, Mrs. J. M. Anderson; vice president, Mrs. J. J. Cosgrove; treasurer, Mrs. S. G. Russell, and secretary, Mrs. R. C. DeLautre. After the business session, bridge was played, high score going to Mrs. Harry Pruess and Mrs. J. M. Anderson. Refreshments were served at the close of the evening and a good time was enjoyed by all who were present.

Oakland Auxiliary Installs New Officers

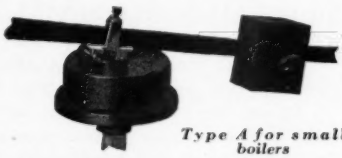
A simple ceremony, but one that was conducted amid a profusion of roses, carnations and many native varieties of California spring flowers, marked the installation on February 17th of the officers who will guide the affairs of the Oakland, California, auxiliary during 1930.

The affair was preceded by a delicious luncheon served in the Renaissance Room of the Women's City Club at 1428 Alice street. Mrs. J. W. Rankin presided at the

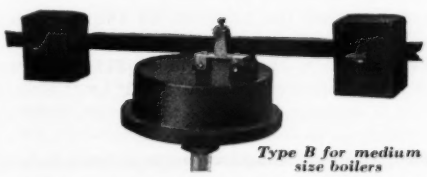
Officers of the Woman's Auxiliary to the Merchant Plumbers' Association of Alameda County, Oakland, Calif. Left to right: Mrs. Lester Jackson, treasurer; Mrs. W. D. J. Evans, vice president; Mrs. R. H. Spiersch, president; Mrs. L. H Bryant, secretary; Mrs. H. LeGassick, marshal

The Operating Efficiency *of a* Good Heating System *is largely a matter of control*

METAPHRAM Damper Regulators

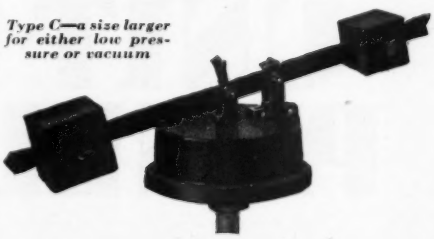


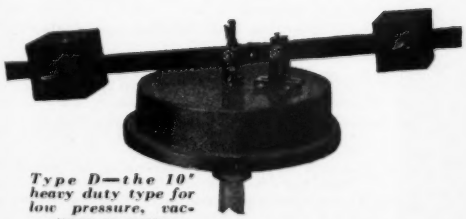
Type A for small boilers



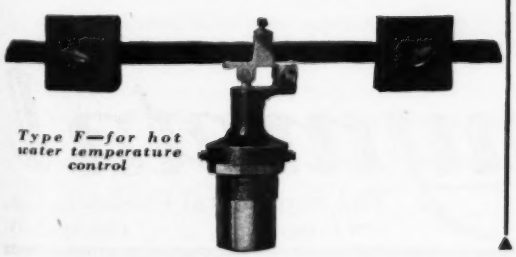
Type B for medium size boilers

Type C—a size larger for either low pressure or vacuum





Type D—the 10" heavy duty type for low pressure, vacuum or vapor



Type F—for hot water temperature control

The best heating system you ever installed won't give continued heat satisfaction if the pressure or temperature delivered by the boiler is constantly fluctuating, or if damper control is a manual operation.

Fluctuations in heat output are eliminated by *good* damper control; but a good damper regulator must be capable of

(1) *Replacing manual control of draft and check dampers between periods of firing.*

(2) *Maintaining a rate of combustion to meet heating requirements.*

(3) *Preventing excessive "lag" or "over-runs" in boiler delivery.*

Every requirement for good damper control on hand fired boilers is met by Metaphram Damper Regulators.

Long life, continued efficiency, extreme sensitivity, and *sufficient power* to raise and lower draft and check dampers on any low pressure domestic heating boiler you may install.

Descriptive bulletins will be mailed on request.

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National Systems of Heat Regulation and Humidity Control, Metaphram Dampers, Metaphram Motors, Industrial Thermostatic Devices, A-Jacks Steam Damper Regulator for high pressure boilers, Metaphram Damper Regulators for domestic steam, vapor, vacuum and hot water heating boilers, Metaphram Furnace Regulators.

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installation ceremony, following which the retiring officers were presented with handsome boutonnieres. The balance of the afternoon was taken up with whist, honors going to Mrs. R. H. Spiersch, Mrs. George Stoddard and Mrs. Walter Gray. Officers serving for the current year are: Mrs. R. H. Spiersch, president; Mrs. W. D. J. Evans, vice president; Mrs. L. H. Bryant, secretary; Mrs. L. J. Jackson, treasurer; Mrs. H. LeGassick, marshall. The committee to whom credit is due for the success of this occasion was headed by Mrs. J. B. Morse, assisted by Mesdames B. T. Schullerts, Arthur Johnson and D. W. Durant.

Germantown Auxiliary Gives Radio Party

The Ladies' Auxiliary of the Master Plumbers' Association of Germantown, Pa., recently held a radio party at the home of Mrs. I. Lee. Twenty-two persons were there, and a most enjoyable evening was spent. After the games were over Mrs. Lee served refreshments, and all those attending agreed that the party was a success.

Denver Ladies' Auxiliary Gives Valentine Party

The Denver Ladies' Auxiliary held an evening valentine party on February 15, at the home of Mr. and Mrs. V. A. Kandorf. Dinner was served at six o'clock, thirty-eight members partaking of the delicious repast. Monte carlo was played later in the evening. Those present were: Mesdames and Messrs. J. P. Brickey, E. B. Clayton, C. Cooper, J. J. Laverty, F. H. Hanlin, R. A. Hurley, V. A. Kiser, F. Samson, S. Slattery, F. Welle, F. Bock, R. Demmer, G. Stocking, F. X. Bordeau, P. J. Warhot, Clyde Newman, Mr. J. Hensler, Mrs. McGrew, Mrs. H. Reeves, Mrs. Julia Hensler, and the host and hostess, Mr. and Mrs. V. A. Kandorf. Honors at cards went to Mrs. Demmer, Mrs. McGrew, Mrs. Bordeau, Messrs. Brickey, Stocking and Hamlin. The next meeting will be held at the home of Mrs. Julia Hensler, when luncheon will be served at one o'clock.

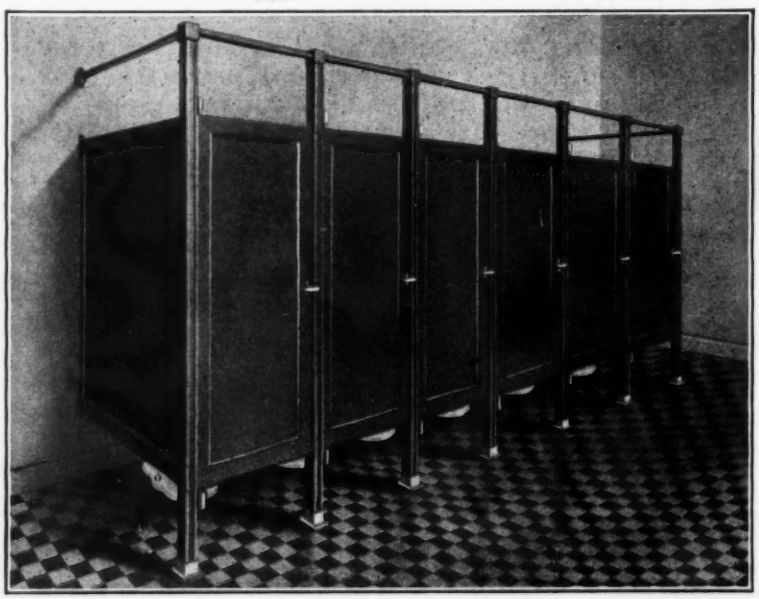
Schenectady Auxiliary Gives Card Party

The Woman's Auxiliary to the Schenectady (N. Y.) Master Plumbers' Association recently held a public card party, making the third of a series. There were fourteen tables in progress. Sandwiches, cake and coffee were served, and all present enjoyed the evening. The regular February meeting of the auxiliary was held at the home of Mrs. W. Gass, Sr., and was well attended. A hall was obtained at a very reasonable cost, and the auxiliary will now meet there the second Wednesday of each month beginning with March. An election of officers took place at this meeting which resulted in the re-election of the old officers. This auxiliary is one year old and has a membership of twenty-five. Following the business session, cards were enjoyed, while refreshments of coffee and cake were served. The auxiliary ladies were invited to dinner by the master plumbers at the Elks Club on February 24.

South Side Auxiliary Holds February Meeting

At the Broadview hotel, Chicago, on February 5, the regular meeting of the South Side Woman's Auxiliary was held. The hostesses for this occasion were Mrs. William Hildeman, Mrs. J. Khym, Mrs. G. A. Larson, Mrs. O. R. Larson and Mrs. A. McCann. Thirty-three members enjoyed a very delicious luncheon, following which the regular business session was in order.

Mrs. Ritter reported the payment of the last installment to the national scholarship fund, toward which the auxiliary contributed in all, the sum of $325. A report was given of a very successful year's work by the retiring treasurer, Mrs. Compton, following which Mrs. Hildeman,



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Unit Assembly of partition panel and post, welded into one unit at the factory.

Easier Erection assured by the above assembly, plus the new adjustable wall bracket feature.

Adjustable Wall Bracket permits ample adjustment for all wall conditions, and allows wall-clearance for sanitation and ventilation.

Fine Appearance throughout—panels and doors designed for beauty as well as sanitation, and trimmed with neat drawn moulds.

New Design Hinges—All-assembled and encased, full-floating Gravity Roller Bearing Hinges.

New Super-Finish—enamelled in "Sanylene," the new crack-and-chip-resistant finish.

And Finally—Economy—This new Sanymetal design is priced at the most reasonable figure consistent with substantial quality. Before you buy—investigate Sanymetal Unit-Panel.

Sanymetal steel compartments are made in several designs for toilet, shower, and dressing enclosures. Write for descriptive literature.

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state vice president, was called upon to say a few words. Mrs. Hildeman told of the splendid time the ladies had at the state convention held at Rockford, and of the delightful luncheon prepared by Mrs. Ritter and Mrs. Compton at Rockford for the ladies of the south side auxiliary. Mrs. Shaw read the social committee report.

The officers for the coming year are Mrs. Charles Harris, president; Mrs. H. D. Jacobs, vice president; Mrs. Kline, treasurer, and Mrs. Shaw, secretary.

The retiring president, Mrs. Ritter, reported the year's work, which reflected her fine leadership throughout the past year. She spoke of the pleasant social activities of the organization and also of the charitable work.

The auxiliary, through Mrs. Compton, presented Mrs. Ritter with a set of beautiful sherbet glasses as a token of gratitude and appreciation. Mrs. Shaw was presented with a lovely leather purse. Later, at cards, high scores in bridge went to Mrs. Taffe, Mrs. Khym and Mrs. Hager. Mrs. Frank Shaw won honors at five hundred.

A Message To The Auxiliaries

By Mrs. A. A. Zertanna of St. Louis,
President of the Missouri Division
Women's Auxiliary to the Master
Plumbers' Association

I think that all of us feel that the various women's auxiliaries have been the means of accomplishing much good during the past year. The increased co-operation with the master plumbers' associations is gratifying to us. It is also a source of pleasure to feel that we have a part in the plumbing and heating industry, through the increased interest and understanding of its problems, which comes to the members of the auxiliaries. The state of Missouri has several large and active auxiliaries in which much interest and enthusiasm is manifested. The state convention will be held in St. Louis on March 17 and 18, and an interesting program has been arranged. I am sure we will have a large attendance of auxiliary members from all over the state, and I would like to urge all those who possibly can to arrange to attend the convention.

St. Louis Auxiliary Prepares for Convention

A large gathering of ladies of the St. Louis auxiliary recently attended a dinner in the Daniel Boone room of the Hotel Statler. At this time new officers were installed. After dinner, cards were played. The St. Louis ladies are working hard to make the state convention, which is to be held in St. Louis, March 17 and 18, a very successful and enjoyable one, and they wish to extend to all the Missouri women an invitation to attend this convention.

South Shore League Auxiliary Meets

On Saturday afternoon, February 15, the Ladies Auxiliary of the South Shore League of Master Plumbers held its monthly meeting at Hotel Racine, Racine, Wis.

The election of officers took place following the regular business. The officers for the ensuing year are president, Mrs. H. J. Smith, Racine; vice president, Mrs. J. Neary, South Milwaukee; secretary, Mrs. James Murphy, Racine; treasurer, Mrs. August Fuge, West Bend; sunshine chairman, Mrs. August Steinhoff, Racine.

Cards were played the rest of the afternoon, honors going to Mrs. Pugh, Mrs. Neary, Mrs. Brunk and Mrs. Feiner. At 6 o'clock, dinner was enjoyed in the main dining room of the hotel.

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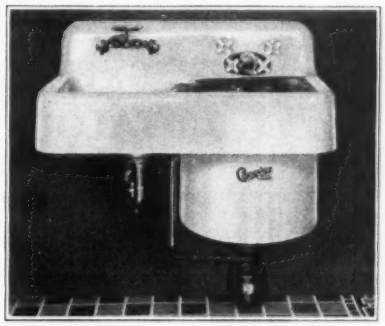

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MULTI-FLOW TANK HEATER
Copper Coil *and* Bronze Fittings
Insure Clean Hot Water

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Made in No. 12 and No. 16 sizes for residences and No. 20 for apartments, dormitories or clubs.

Triangular grates, lift draft, enclosed base, red vitreous enamel jacket.

No. 12 Heater (illustrated) best suited to Average Single House.

Also made in sizes No. 16 for large residence and No. 20 for apartment houses.

Send for Special Deal and Bulletin No. 52.

Cut Away View, above

THE NATIONAL PIPE BENDING COMPANY
Established 1883
174-A River St., New Haven, Conn.
Boston New York Philadelphia

A True Guide Post *for all* Buyers *of* Plumbing *and* Heating Products

There are many thousands of different items manufactured for use in the plumbing and heating field. Knowing the sources of supply of all these many products is not expected of any one buyer.

Domestic Engineering Plumbing and Heating Catalog serves as a true guide in this respect. It gives the busy buyer the information needed for buying practically any item manufactured by the plumbing and heating industries. It contains an abundance of information, all bound under one cover, that is impossible to obtain elsewhere.

Wholesalers, Specialty Dealers and Plumbing and Heating Contractors who have not yet ordered copies of **Domestic Engineering Plumbing and Heating Catalog** will find it to their advantage to do so immediately.

Standard Catalog Size
7¾ x 10⅝ inches
This Book contains the Catalogs of Hundreds of manufacturers of Plumbing and Heating Products.

Price prepaid
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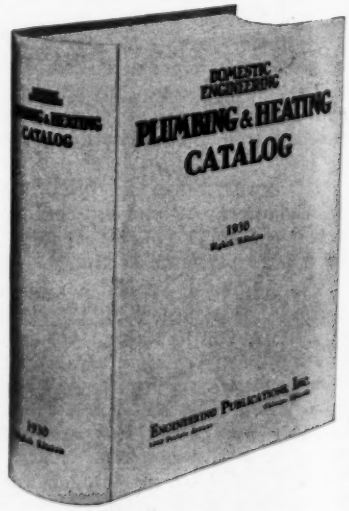


DOMESTIC ENGINEERING
Catalog Department
1900 Prairie Avenue Chicago, Illinois

Business Changes

Camden, N. Y.—Seymour E. Yager, plumbing and heating contractor, has disposed of his business, including the business block in South Park street, to John E. Eastham, who will continue the business established by Mr. Yager.

Watertown, N. Y.—George H. Hyde, Inc., successors to Hyde Bros. of 1008-1012 River street, has filed papers of incorporation, listing a capital of $100,000. The original concern was founded in 1893. Associated with George H. Hyde in the new firm are Albert C. Hyde, superintendent, and Frederick G. Mullins, foreman of the plant and storehouse.

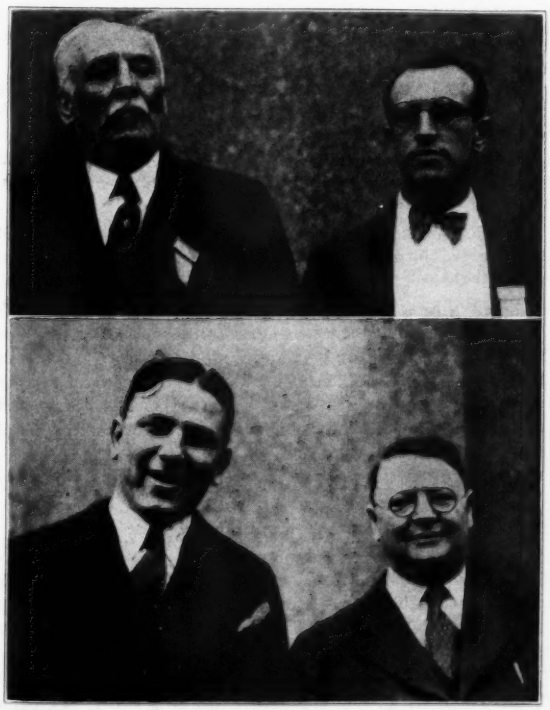
Pratt, Kan.—Kyle W. Talbott has moved the stock and equipment of his plumbing and heating business from 118 South Main street to 122 South Main street.

York, Nebr.—O. E. Tilden, formerly operating his own plumbing and heating establishment, has transferred his stock and equipment to the York Equipment Co., 216 East Sixth street. E. B. Mitchell is manager of the latter company.

Madison, Wis.—C. E. Bates, Inc., plumbing and heating contracting, has moved its business into enlarged quarters at 1425 Regent street. The new building provides excellent display space. J. F. Enders is president of the firm and C. E. Bates is secretary-treasurer.

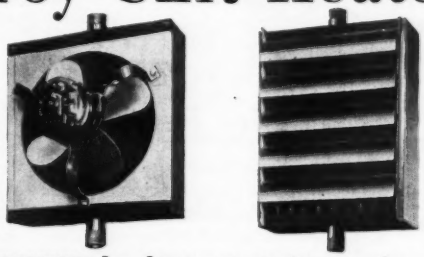
Craig, Colo.—C. J. Kennedy has sold his plumbing business to L. C. Craig and Fred Fick, who will conduct the business from its old location in the basement of the Kennedy building.

Grand Rapids, Mich.—The Dykman Heating and Plumb-



Top row: W. A. Ingram and Donald Ingram of Lake Geneva, Wis. Bottom row: Arthur Krueger, Milwaukee branch manager of John Douglas Co.; S. M. Youngblut, Milwaukee manager of EverHot Heater Co. Photos taken at recent convention of Wisconsin Master Plumbers Association, held at Milwaukee

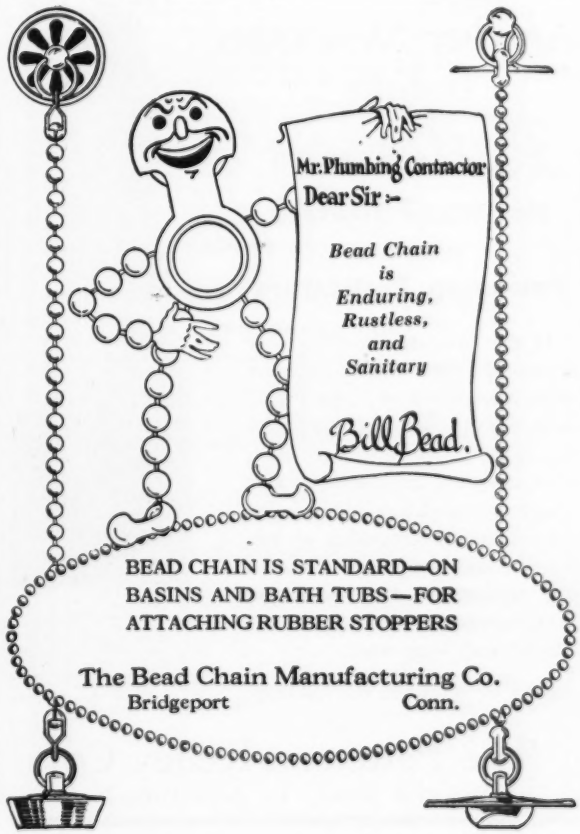
for overhead heating
Kroy Unit Heaters



DESIGNED by the same engineers who pioneered the *Heat-Diffusing Unit* principle—Kroy Unit Heaters reflect the high quality materials and fine workmanship that characterize all York products.
They are equipped with Super-Fin coils. Consequently, they may be used with any steam pressure up to 200 pounds.
These Units are supplied in a variety of sizes and capacities—each fully guaranteed. Specifications and prices upon request. Branch offices in all principal cities.

YORK HEATING & VENTILATING CORP.
1573 Sansom Street, Philadelphia
Manufacturers of Heat-Diffusing Units, Air-Conditioning Units, Air-Cooling Units and Super-Fin Fan Blast Radiation.

KROY UNIT HEATER


Mr. Plumbing Contractor
Dear Sir:-
Bead Chain is Enduring, Rustless, and Sanitary
Bill Bead.
BEAD CHAIN IS STANDARD—ON BASINS AND BATH TUBS—FOR ATTACHING RUBBER STOPPERS
The Bead Chain Manufacturing Co.
Bridgeport Conn.

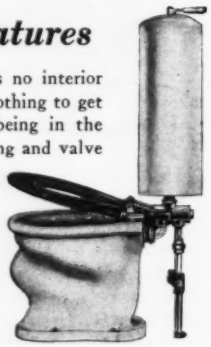
Automatic Operation

They may forget—but a Jewel doesn't

The one big feature in selling JEWEL Auto Pneu Matic Water Closets is this—flushing is positive and automatic. Certain features found only in a Jewel make it practical, dependable and economical, and because it's trouble-free the most profitable for you!

Exclusive Features

The Jewel Flush Valve has no interior springs to rust or corrode, nothing to get out of order, the springs being in the seat hinges where they belong and valve action being positive at all times! Simplicity, reliability, demand—profit! Write for full particulars about the trouble-free easy-selling JEWEL line!



Ask your jobber—or write!

The BOWLUS MFG. CO., Springfield, O.

JEWEL AUTO PNEU MATIC WATER CLOSETS

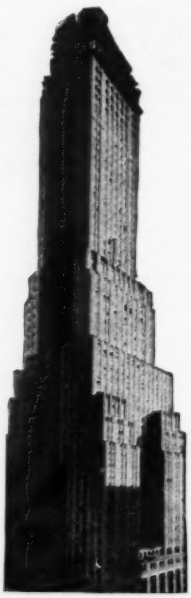
Another Skyscraper Installs

Patterson

Hot Water Heaters and Patterson Preheaters

If any more dependable, more all-around hot water heaters were manufactured, they would have been installed in this building. For, if you know the men who designed and erected this important structure, you know that clever salesmanship or low prices could not induce them to use equipment that had not demonstrated itself by hard knocks and long wear.

May we send you our catalog?



Bank of Manhattan Bldg., New York
60 stories, 875 ft. high
H. Craig Severance, Architect
Starrett Brothers, Builders
Baker, Smith & Co., Heating Contractors
W. G. Cornell Co., Plumbing Contractors

The Patterson-Kelley Co.
106 East 40th Street - New York, N. Y.

ing Shop has moved to the corner of Lake Michigan drive and Indiana avenue.

Bartlesville, Okla.—The Parsons Electric & Plumbing Co., 412 West Third street, of which E. H. Parsons is manager, will soon begin erection of a new salesroom and warehouse.

Columbia Heights, Minn.—Peter Kolby, a partner in the business of the Heights Plumbing Co., has succeeded to the entire business, and will continue it as the Peter Kolby Plumbing Co.

Waterloo, Iowa.—Rynerson & Koch, engaged in the plumbing and heating business at 220 East Fifth street, are planning erection of a two-story business building.

New Business Ventures

New York City.—The Harlem Plumbing Co. has just been organized and incorporated, with a capital of $10,000, to establish and operate a plumbing contracting, business in Harlem. The new concern is represented by S. S. Goldsmith, 291 Broadway.

Alameda County, Calif.—The Freitas Plumbing & Heating Co. has been incorporated with a capital stock of $50,000 to engage in the plumbing and heating business in Alameda county by J. A. and A. J. Freitas of Oakland and L. Wagner of Berkeley.

Los Angeles, Calif.—The J. Hokom Co., Inc., plumbing and heating contractors, recently opened its third branch establishment in the Los Angeles metropolitan area. The new store is at 4015 West Pico street, while the headquarters company is at 4312 South Broadway.

Cedarhurst, N. Y.—Sammis and Morrissette, Inc., has been chartered, with a capital of $5,000, to establish and operate a plumbing and heating contracting business. The new concern is represented by J. Schettino, Jr., Far Rockaway, L. I.

Sheboygan, Wis.—The G. N. G. Hardware & Heating Co. has filed articles of organization, with its capitalization listed at 400 shares at $100 each. E. W. Gersemehl, H. Guessenhainer, F. J. Nelesen and A. Zeinemann are incorporators of the firm, which will conduct a plumbing and heating and hardware business.

Pontiac, Mich.—George A. Thompson & Co., engaged in the plumbing and heating business at 69 Dakota drive, has incorporated its business under the name of Thompson Plumbing Heating Co., with a capital stock of $5,000.

Berea, Ohio—The Curtiss Plumbing and Heating Co. has been organized and incorporated, with a capital of $25,000, by Paul B. Shane and associates, to take over and continue the operation of the Curtiss Plumbing and Heating Shop. The new concern is represented by Paul B. Mitchell, local attorney.

Buffalo, N. Y.—The Linwood Heating Co., specializing in heating engineering and contracting, has been established here by William H. Manning, of Eden, N. Y.

New York, N. Y.—Oscar Simon, Inc., has been organized and incorporated by Oscar Simon and associates, with a capital of $5,000, to establish and operate a plumbing contracting business in the Bronx. The new concern is represented by S. H. Lifschitz, 1910 Arthur avenue, the Bronx.

New York, N. Y.—The Worth Plumbing Corp. has been chartered, with a capital of $60,000, to establish and operate a plumbing contracting business in the Bronx. Representing the new concern is A. J. Halprin, 170 Broadway.

New York City—H. J. Reeves and associates have or-

ganized and incorporated the H. J. Reeves Co., with a capital of $20,000, to engage in the plumbing contracting business. The new firm is represented by S. V. Ryan, attorney, Albany, N. Y.

Hopewell, Va.—The Prince George Plumbing and Heating Co. has been granted a charter, with a capital of $25,000, to conduct a plumbing and heating contracting business.

Indianapolis, Ind.—Edwin W. Kautsky, Inc., has been organized and incorporated to engage in the plumbing and heating contracting business, with a capital stock of 2,000 shares having a no par value.

Galesburg, Ill.—Albrecht Bros., plumbing, heating and electrical contractors, have opened a place of business at 74 Public square. The firm has other branches at Kewanee and Princeton.

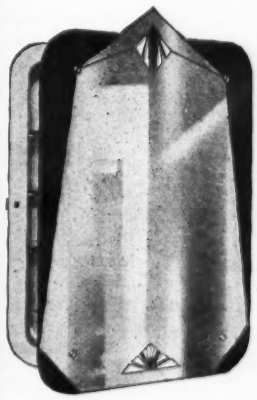
Elkin, N. C.—The Elkin Plumbing & Heating Co. has been organized and incorporated with a capital of $50,000 to engage in the plumbing and heating contracting business. J. D. Holcombe and A. D. Spann are the incorporators.

Springfield, Mass.—Fred C. McClean, Inc., has incorporated to engage in the heating and ventilating business with a capital of $30,000. Fred C. McClean, 108 Orange street, Springfield, heads the company.

Winchester, Mass.—The Fells Plumbing & Heating Co., Inc., has filed a certificate of incorporation and will conduct a plumbing and heating business with an authorized capital of $12,000. Pierce J. Ryan, 79 Pleasant street, Stoneham, Mass., is president.

Charles W. Alcock, past president, Chicago; C. S. McKay and J. S. MacKenzie, both of Chicago. Middle row: T. H. Decker of Highland Park; J. H. Moran, president of Lake County Sanitary and Heating Engineers, Highland Park; J. T. McGrath, Libertyville; J. L. Frye of Lake Forest. Bottom row: C. E. Thorkelson, Decatur; Walter Forssman, Moline; Frank Christman, Springfield; R. D. Ticknor, Champaign; Clarence A. Bolton, state secretary, Chicago Heights; Peter M. Munn, Chicago; L. V. Anderson, of Lake Forest, president of State Association of Executive Secretaries; Kirk A. Journy, Rock Island; J. H. Jansen, Peoria. Photos taken at recent convention of Illinois Master Plumbers Association, held at Rockford

This year it'll be Corcoran Cabinets . . .



. . . . that will stand out above all the rest — surpassing architects' expectations and creating profits for those who tie up with Corcoran.

Distribution almost the world over during their first year is conclusive evidence of their superiority. Corcoran Cabinets have met with instant acceptance wherever introduced because they are the original and only one-piece steel bathroom cabinets. No cracks — No seams — No welded joints — No raw edges. A few most desirable territories are still open — mail the coupon today.

Sold only through Jobbers

The Corcoran Mfg. Co.

CINCINNATI, OHIO

Complete stocks now being carried in Chicago, New York, Philadelphia, Boston and Los Angeles; communicate with Corcoran offices at 1820 McCormick Bldg., Chicago; 1228 Locust St., Philadelphia; 11 West 42nd St., New York; Beaudette & Graham Co., 915 Boylston St., Boston, and Hamilton-Gardner Co., 509 West Pico Boulevard, Los Angeles.

OUR CATALOGUE IS FILED IN SWEET'S

MAIL THIS COUPON

CORCORAN MFG. COMPANY, DEPT. DE-3-30.

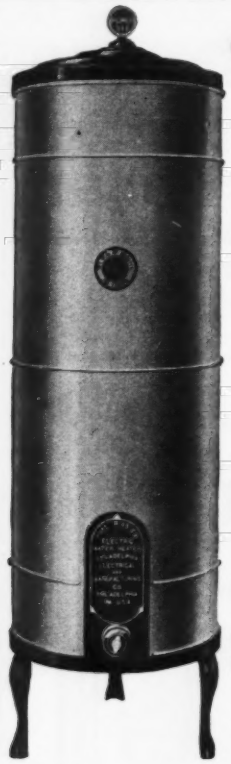
Gentlemen:
We are interested in Corcoran One-Piece Steel Bathroom Cabinets. Kindly send catalog and full details.

Name.....

Address.....

City..... State.....

☐ Jobber ☐ Contractor



Visible Evidence!

Pemco Quality . . Convenience . . . Beauty . . . rugged construction . . . the exclusive Pemco Baffle.

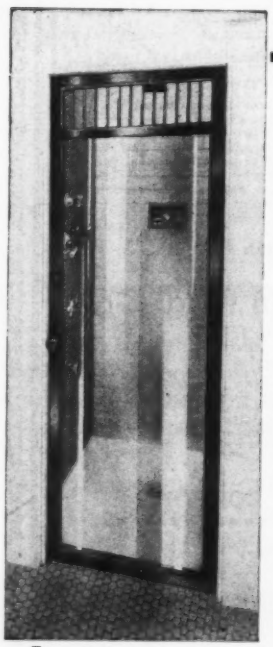
Write for New Bulletin No. 42

PEMCO

ELECTRIC WATER HEATER

Philadelphia Electrical & Manufacturing Company

1228-1236 North 31st Street Philadelphia, Pa.



Let *C & S* Show You Bigger Profits

Take the time right now to investigate the *C & S* line of Shower Doors, Enclosures and Shields. They're available in all of the wanted finishes—Chromium Plate, Nickel Silver or Nickel Plate.

Ask us to show you how you can get bigger profits out of your territory, right now, with the *C & S* line.

Sold thru your jobber

Crist & Schilken Co., Inc.

Established 1903

500-508 37th St. Pittsburgh, Penna.

New Trade Literature

Folder of Philadelphia Electrical & Mfg. Co.

Philadelphia Electrical & Mfg. Co., of Philadelphia, is distributing a folder describing its electric water heaters. These heaters are of storage type. Various parts of the heater, including the duplex heating unit, are described in detail.

Circular of Kewanee Boiler Corp.

Kewanee Boiler Corp., of Kewanee, Ill., is distributing a circular with the caption, "Modern Decoration Demands Color Smartness." Two shades of radiators are shown in colors, with gold background.

"Zone Heating"

Webster Tallmadge & Co., Inc., of New York City, has issued Bulletin 130, entitled "Zone Heating with Simplified Orifice Distribution and Electrically Remote Control." The bulletin discusses the problems involved in the correct design of a heating system, shows how various typical service conditions may be provided for and explains the features of the company's zone system, together with its method of remote control. Several diagrams show graphically how distribution of heat may be obtained in buildings of various types.

Circular of Jones Hollow Ware Co.

Jones Hollow Ware Co., of Baltimore, Md., is sending out a circular describing its boilers especially designed for use with oil. Two cut-away views show the construction of the boiler. The combustion chamber designed for oil burning and the thin vertical tubes in the heating elements are pointed out.

"The Invisible Home"

"The Invisible Home" is the title of a booklet just issued by Johns-Manville Corp., of New York City. The corporation's insulating material, made from rock wool, and blown into walls through a hose, by means of compressed air, is described in the booklet. The title refers to the "invisible home" which may be made within the walls by having them blown full of the insulation to keep in heat in winter, and keep out heat in summer. The booklet also contains an interesting account of the discovery of mineral wool, as a volcanic deposit. Numerous illustrations picture homes in which the concern's insulation has been used.

"Invisible Radiators"

"Invisible Radiators" is the title of a pamphlet just issued by The Herman Nelson Corp., of Moline, Ill. The pamphlet contains forty-eight pages with numerous illustrations, and it describes the method of installation of two types of radiators, the "immured type" sealed within the wall of the room, permitting plaster to be run in front of the radiator, and the "paneled" type, the front of which is removable. Thirteen pages are devoted to specifications and tables of dimensions and capacities for the radiators.

"Oil Heat and the Business of Living"

"Oil Heat and the Business of Living" is the title of a well-illustrated booklet that has been prepared for distribution by the Oil Heating Institute, 342 Madison avenue, New York City. The booklet answers numerous questions concerning domestic oil burners that are likely to arise in the minds of interested families.

"Modernizing Obsolete Heating Systems"

Warren Webster & Co., Camden, N. J., has just issued a pamphlet with the title, "Modernizing Obsolete Heating Systems." The cover design is definitely co-ordinated with the modernization advertisements which the company has been using. The booklet points out sources of

waste through using obsolete heating systems, resulting in increased expense of building operation and decreased income from building. Means of modernizing are pointed out, and various traps and attachments, such as packless valves, motor valves, waterseal motors, etc., are described and illustrated.

Circular of Bowlus Mfg. Co.

Bowlus Mfg. Co., of Springfield, Ohio, is sending out a circular describing its automatically-flushed water closet. Two types of this closet are illustrated, and a diagram of the flush valve is also given.

Ric-wiL Co.'s Bulletin

The Ric-wiL Co., of Cleveland, Ohio, is sending out a bulletin describing its sewer and drain products. A tile foundation and drain for sewer systems, also a sewer joint compound, cast iron drain pipe and filter tape are included in the bulletin.

Poster of Crest Mfg. Co.

The Crest Mfg. Co., Inc., of Long Island City, N. Y., has prepared a one-sheet window poster measuring 19 by 25 inches. The poster is in colors, and is designed to draw the attention of the plumbers' customers to the need of faucet overhauling.

Catalog of Harbison-Walker Refractories Co.

"Modern Refractory Practice" is the title of a catalog just issued by Harbison-Walker Refractories Co., of Pittsburgh. The catalog consists of 178 pages, 8 by 11 inches. It is handsomely bound in cloth, and printed on highly glazed paper, with numerous illustrations. Boiler settings and fireclay refractories are some of the products described.

"Homes of Comfort"

A ninety-five page booklet, entitled "Homes of Comfort," has been published by Crane Co., Chicago. Samples of the colors used in the company's plumbing fixtures are given. Attractive colored pictures show various combinations in colored plumbing fixtures in bathroom and kitchen. There is a Dutch room in blue, another with blue and yellow, a third representing a Moroccan interior in green and blue tiling and fixtures. Numerous styles of lavatories, bathtubs, closets, sinks, shower baths, laundry trays, etc., are given.

Circular of Syracuse Steam Generator, Inc.

Syracuse Steam Generator, Inc., of Syracuse, N. Y., is distributing a circular describing a boiler with copper steam generator. The steam generator is illustrated.

Catalog of Charlotte Pipe & Foundry Co.

Charlotte Pipe & Foundry Co., of Charlotte, N. C., is sending out its Catalog D, listing soil pipe and fittings. Hubs, bends, tees, cleanouts, increasers, traps, ferrules, etc., are among the items listed. The catalog also contains an illustration of the company's plant.

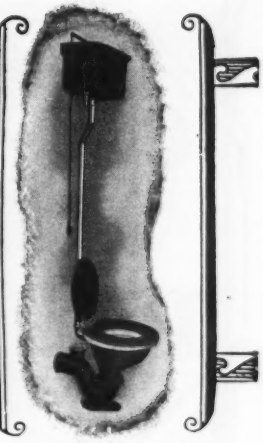
Booklets of Kewanee Boiler Corp.

Kewanee Boiler Corp., of Kewanee, Ill., has just issued a booklet describing its residence type boiler for bungalows, homes and smaller buildings. The booklet is illustrated in colors with front, rear, side and cut-away views of the boiler. Several blue print diagrams show method of installation of the boiler. "A Healthy Heart for Every Home" is the title of another booklet describing the company's boiler in detail.

Catalog of Johnston Brothers, Inc.

Johnston Brothers, Inc., of Ferrysburg, Mich., has just issued its Catalog No. H-300, describing its steel heating boilers. A sectional view shows the fire travel and combustion chamber of the concern's boilers. Several front and side illustrations are also given, as well as numerous views of buildings in which the boilers have been installed. Specifications and dimension sheets are included.

High Tank Combination



You know the demands made by factories for plumbing equipment. So do we and we've built in this high tank combination, the answer to every one of those demands.

Write for catalog.

JONES HOLLOW WARE CO.
BALTIMORE :: MARYLAND

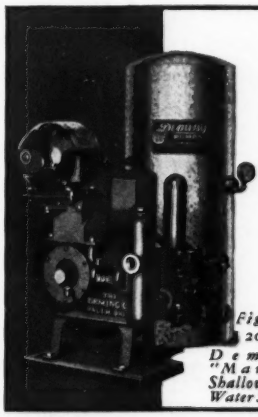


Figure 2085 Deming "Marvel" Shallow Well Water System.

WRITE for Water System Catalog L, which gives complete information on Deming Shallow and Deep Well Water Systems.

THE DEMING CO.
SALEM, OHIO - Est. 1880

DEMING

1903-1930

Over a Quarter Century of Service

□ □ □

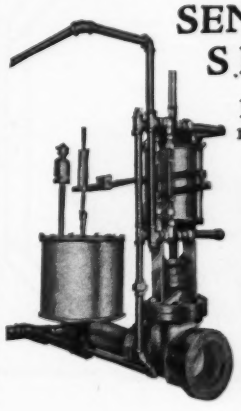
A-1 QUALITY ACCURATE GAUGE PROPER TAPER
CORRECT NUMBER OF THREADS
PROMPT SHIPMENT OF ORDERS ECONOMICAL PRICES

All backed by twenty-seven years of manufacturing experience are assurances of your satisfaction with

"RAVENA" IRON PIPE FITTINGS

□ □ □

RAVENA IRON CO., Ravena, N. Y.



SENTINEL SAFETY SEWER VALVE

LITTLE GIANT MFG. CO.,
1407 Third Ave. S., - Minneapolis, Minn.

The Spring flood season demands complete protection from sewer back-up. Without it, property will be damaged and health endangered by the inevitable back flow of overtaxed sewers. The Sentinel Safety Sewer Valve is 100% prevention. It is the only mechanical device that operates automatically without human attention or electric current. Its gate valve closes and opens under hydraulic pressure. Its powerful action never fails. Write for particulars.

FOR
COPPER
TUBE
PLUMBING

ANDERSON

Anderson Couplings for Copper Tube Plumbing are far advanced in principle, design and quality.

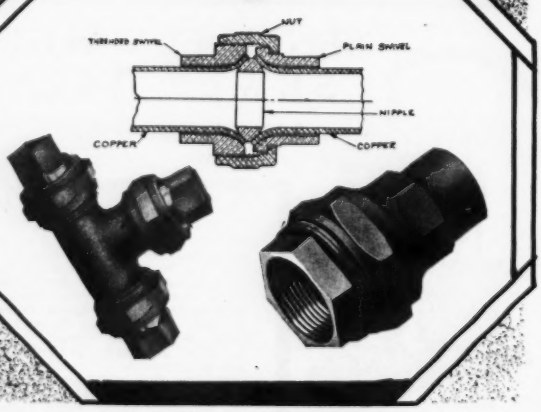
Three Anderson Couplings will do the entire job.

The illustration below shows how Anderson Couplings are made and why they must be TIGHT.

Write for catalog

THE CHAPMAN VALVE MANUFACTURING CO.
INDIAN ORCHARD - MASS.

COUPLINGS



Pipelines
Connected by L Y T

Station "P. B. F." broadcasts the following lines of good cheer:

A girl may wear a golf skirt and not play golf, or wear a bathing suit and not go near the water, but when she puts on a wedding gown, boys, she means business.

You can't make very good time on the road to ruin nowadays. The traffic is terrible.

I call my three-dollar hat "Ethyl" because it's No Knox.

Did you hear about the Jewish clothing merchant who went into the real estate business? Well, he had two roof apartments to rent and advertised "Two Pent Suites."

The ocean down in Florida,
Believe it, on my soul,
It is the only thing down there
That hasn't lost its roll.

The postman on his vacation goes on a long hike, but when the mason takes a day off he gets plastered.

I love to watch the ticker tape,
And see the prices fall,
And see how much I've saved on stocks
By having none at all.

A boy likes to sit before an open fire and picture things in the blaze, especially his schoolhouse.

THIS IS THE WAY TO SELL

The owner of a car of doubtful vintage ultimately concluded that it needed overhauling. After the garage man had walked around it a couple of times, he remarked:

"That's a good horn you have. Let's jack it up and run a new car under it."

NIBCO NONSENSE.

THOSE KIDS

Small Boy: "Grandpa, when are you going to play football?"

Grandpa: "Football? I don't play football."

Small Boy: "But dad said we'd get a new car as soon as you kicked off."

CORRECTION

One day a glaring headline read: "Half the City Council Are Crooks."

A retraction in full was demanded of the editor, under penalty of arrest.

He ran the following headline the next day: "Half the City Council Aren't Crooks."

The Crucible.

"SY" SEZ

Women always look their best to find a man.

A West Virginia darkey, a blacksmith, recently announced a change in his business thus: "Notice: De co-partnership heretofore resisting between me an' Mose Skinner is hereby resolved. Dem what owe de firm will settle with me. And dem what de firm owes will settle wid Mose."

Mary has a little skirt,
So neat, so bright, so airy:
It never shows a speck of dirt
But it surely does show Mary.

A tooth in the gum is worth six in a plate.

"SY" MARTIN, Owensboro, Ky.

We don't seem to be able to catch on to this 5-5-3 business at the naval conference. If seven and eleven were mentioned we'd know what the delegates are doing. L Y T.

Bath a Day Movement

Every industry needs educational effort with the public, to place its service in a true light. Perhaps this is most true about an industry like ours, where the results to be hoped for from an installation of plumbing are more or less taken for granted. People don't think about good health until they are ill. Since plumbing is so closely related to good health, it must be kept constantly before the public in that light. One way is the placing of "The Story of the Bath" in the schools. The figure above represents the 171 *cities and towns where this has been done.*

171

An interesting use was made of "The Story of the Bath" recently by Joseph E. Taggart, supervisor of the plumbing department of Continuation School No. 64, New York City. He prepared a short playlet, or sketch, presented in the assembly hall of the school before a large number of parents and instructors. The sketch was entitled "The Knights of Sanitation." Five of the students in his class appeared in costume, each reciting lines taken from "The Story of the Bath," with a short poem as a prelude in which plumbers were called "Knights of Sanitation." Then followed the four boys who had each a few lines from the booklet to recite.

If you have never read "The Story of the Bath" write us for a free copy. You'll enjoy it; and you'll be able to find use for it in your community.

Epigrams—For Your Use

Don't forget that sometimes an ounce of keep-your-mouth-closed is better than a pound of explanation.

* * *

Mothers teach their babies to talk and then expect them to keep still.

* * *

Politeness is a coin that passes current in every country on earth.

* * *

The talkative seamstress occasionally loses the thread of her discourse.

* * *

Providence takes care of some fools by giving them wives to look after.

* * *

Some men haven't as much horse sense as a mule.

* * *

The average woman spends more time than money when she goes shopping.

* * *

It doesn't add to a woman's disposition to put ruffles on her temper.

* * *

Many an expert swimmer has been drowned in the sea of matrimony.

* * *

One little taste of success makes a man long for all he can swallow.

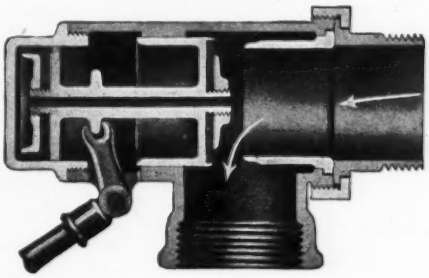
* * *

Take things as they come, but don't knock them as they go.

* * *

Many a callow youth has been hard hit by a soft glance.

U. S. TANK VALVE



All bronze body and mountings.
Renewable valve and seat.
Full size waterway.
Noiseless in operation.
Guaranteed absolutely tight.
Sizes: ¾″ to 4″ inclusive.

Write for catalogue of
CURTIS ENGINEERING SPECIALTIES

JULIAN D'ESTE COMPANY
6 Spice St., Charlestown District
Boston, Mass.

HESSLER
ROOF FLANGES

Ask Your Jobber to Supply You

If you want your men to do better work and do it in half the ordinary time — supply them with Hessler Roof Flanges.

All that is needed to install them is a hammer. No cutting; caulking or fitting. They're made to fit and they never leak.

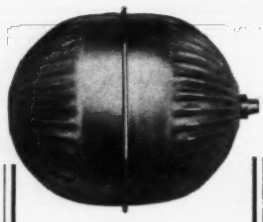
H. E. HESSLER COMPANY
Syracuse, New York

That's all that's used in the manufacture of the Leader Float.

Note its somewhat different shape and the strength of its spud.

A more expansive rubber washer joint allows for expansion and contraction.

Ask your jobber about the Leader Float or write us direct.



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The Reichert Float & Mfg. Co.
2238 Smead Ave.
TOLEDO, OHIO

PAINE
Flattened End Lag Screws

Made in four sizes and furnished with bolts
¼ x 3 ⅜ x 3½ ⅜ x 4 ½ x 5
Will fit any standard lag screw shields of corresponding sizes
Send for samples and prices
THE PAINE COMPANY
2949-53 Carroll Ave., Chicago, Ill. 79 Barclay St., New York, N. Y.

BRASS PIPE NIPPLES

Be sure and ask for Reading Brand Brass Pipe Nipples when purchasing. This simple precaution will save you money, time and reputation for with these good nipples your pipe installations are bound to be better.

Ask your jobber to supply you.

H. W. HUNT COMPANY
READING :: MASS.

The PEERLESS

Automatic Electric Sump Pump and Cellar Drainer

A positive, dependable drainer that is easily installed and may be depended upon to give constant service.

It is sold under a strict money back guarantee.

Write for complete details

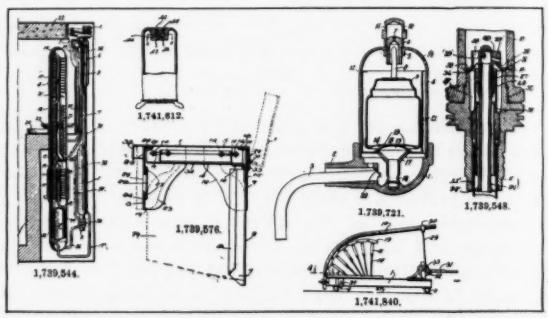
Manufactured by
PEERLESS MFG. CO.
Incorporated
East Norwalk Connecticut

PATENTS

Heating Department

1,739,544. Refrigeration. Richard John Cracknell, London, England, assignor to Electrolux Servel Corporation, New York, N. Y., a corporation of Delaware.

1,739,548. Oil Burner. Franklin Hardinge, Chicago, Ill., assignor to Hardinge Brothers, Inc., Chicago, Ill., a corporation of Illinois.



1,739,576. Radiator Cover and Humidifier. John E. Burke, Fond du Lac, Wis.

1,739,721. Radiator Valve. Charles H. Jockmus, Ansonia, Conn.

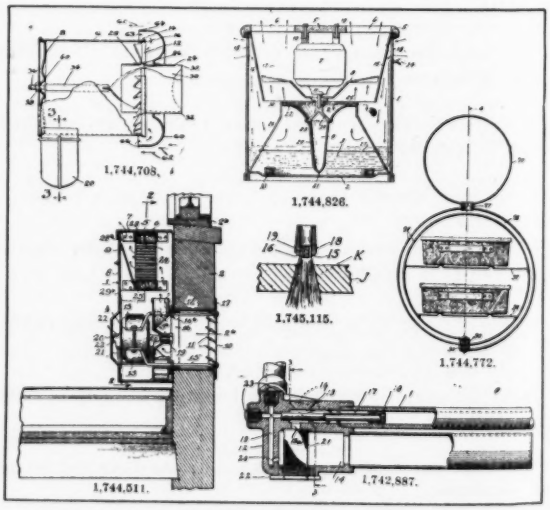
1,741,612. Radiator Relief Valve. August Buss, Detroit, Mich.

1,741,840. Pipe Bender. Arthur J. Harmon and James W. Harmon, Chicago, Ill.

1,744,708. Air Cleaner. Herbert G. Kamrath, Flint, Mich., assignor to A C Spark Plug Company, Flint, Mich., a Company of Michigan.

1,744,511. Heating and Ventilating Unit. Wilfred Shurtleff, Moline, Ill., assignor to Herman Nelson Corporation, Moline, Ill., a Corporation of Illinois.

1,742,887. Burner Assembly. Walter W. Williams, Bloomington, Ill., assignor to Williams Oil-O-Matic Heating Corporation, Bloomington, Ill.



1,744,772. Refrigerating Apparatus. Jesse G. King, Dayton, Ohio, assignor, by mesne assignments, to Frigidaire Corporation, a Corporation of Delaware.

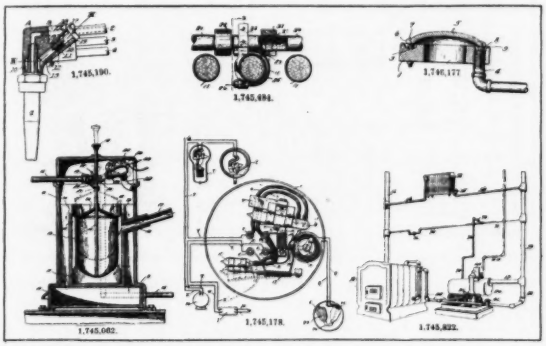
1,744,826. Air-Moistening Device. Samuel C. Cutler, Murray Hill, N. J.

1,745,115. Cutting Torch. Frederick A. Ost, Inglewood, Calif., assignor to Edward M. Smith, Los Angeles, Calif.

1,745,062. Safety Device for Liquid-Fuel Burners. John Scheminger, Jr., Providence, R. I., assignor, by mesne assignments, to Petroleum Heat and Power Company, New York, N. Y., a Corporation of Delaware.

1,745,178. Liquid-Fuel-Burner Control. Ira E. McCabe, Chicago, Ill.

1,745,190. Mixer for Cutting Torches. George C. Quelch, Oakmont, Pa., assignor to International Oxygen Company, Newark, N. J., a Corporation of New Jersey.



1,745,484. Soot Cleaner for Boilers. Isaac Harter, Dongan Hills, N. Y., assignor to The Babcock & Wilcox Company, Bayonne, N. J., a Corporation of New Jersey.

1,745,822. Vacuum Steam Heating System. Howard M. Wylie and Harold E. Adams, South Norwalk, Conn., assignors to Nash Engineering Company, South Norwalk, Conn., a Corporation of Connecticut.

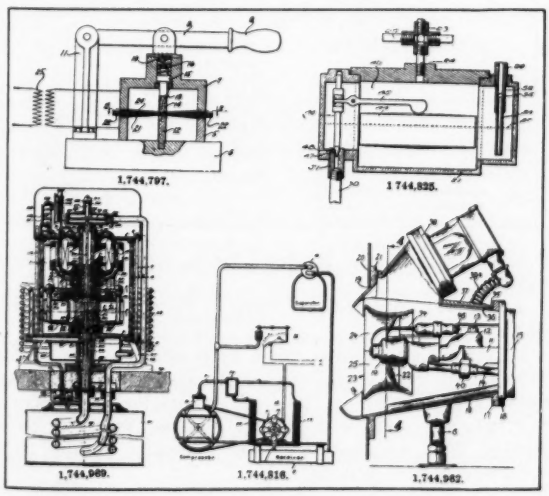
1,746,177. Oil Burner. Lewis F. Williamson, Harrisonville, Mo.

1,744,797. Method of and Apparatus for Welding. Conrad Louis Pfeiffer, Chicago, Ill., assignor to Western Electric Company, Incorporated, New York, N. Y., a Corporation of New York.

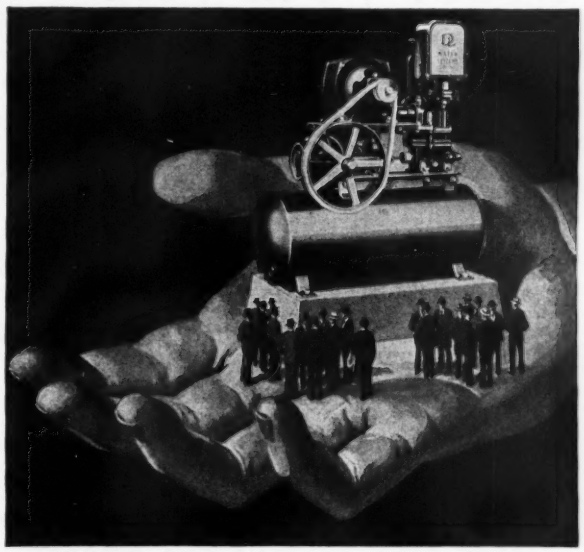
1,744,816. Refrigerating Apparatus. George M. Troup, Dayton, Ohio, assignor, by mesne assignments, to Frigidaire Corporation, a Corporation of Delaware.

1,744,825. Oil-Burning Apparatus. Charles M. Colvin, Wilmette, Ill.

1,744,962. Oil Burner. Forrester L. Hammer, Branford, Conn.



YOU SELL BOTH KINDS OF PROSPECTS



With the D-L WATERBOY

ONLY **$75** f. o. b. Dayton

WHY let pump sales slip through your fingers, when it's so easy to sell the D-L Waterboy.

It costs only $75 f.o.b. Dayton. If your man is a price-buyer he's as good as sold.

And if he's one of those who want the best, tell him that the Waterboy is a General Motors product . . . that it's fully automatic . . . that it starts, stops and runs itself . . . that it delivers up to 225 gallons per hour . . . and that it comes complete with a 5 gallon pressure tank.

This is just the kind of a water system every plumber likes to handle. It's easy to sell and easy to install.

And the Waterboy is only *one* of a complete line of D-L Water Systems for deep and shallow wells. With this line you can take care of *any* water system installation. You can give your customer *exactly* what he wants. And you can arrange General Motors terms to suit him. That's why no sales are lost . . . why more sales are made.

If you're interested in a bigger income, mail coupon for full details of liberal, profit-sharing plan.

DELCO-LIGHT ELECTRIC WATER SYSTEMS

PRODUCTS OF GENERAL MOTORS

"The GOLD STANDARD of Quality"

Also Manufacturers of Delco-Light Electric Plants and Delcogas for Household and Commercial Use

DELCO-LIGHT COMPANY, *Subsidiary of General Motors Corporation*, Dept. B-21, Dayton, Ohio.

Show me how I can build up my business and increase my profits with D-L Water Systems. Sending for the facts does not obligate me in any way.

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Address.....

9-124

Meet your real competitors on their own ground

*By your real competitors we mean all those retailers who address sales messages to your customers—the retailers who sell radios, automobiles, furniture, and hundreds of other things.

They select the newspapers because they have found that newspaper advertising is effective.

Meet them on their own ground with the message of the products and the service you offer—give the prospect an opportunity to balance the benefits of your service with those others.

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Our Retail Advertising Service makes advertising easy for you. We send you cuts every other week for the illustrations—you clip the copy from your issue of DOMESTIC ENGINEERING, and hand it, with the cut, to your newspaper. Easy, isn't it? Send in your order today for three months' service only $4.20.

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1900 Prairie Avenue, Chicago

Send me the *Retail Advertising Service* for 12 weeks.
Check for $4.20 enclosed.

Name.....

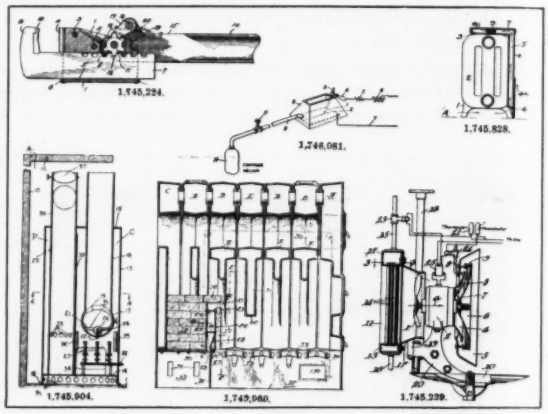
Address.....

City.....State.....

1,744,969. Refrigerating Apparatus. Arthur J. Kercher, Berkeley, Calif.

1,745,224. Pipe Wrench. James E. Magner, Waterloo, Iowa.

1,745,239. Air-Conditioning Apparatus. Frederic F. Bahnson, Winston-Salem, N. C.



1,745,960. Heater. William R. Stockwell, Michigan City, Ind.

1,746,081. Arc Welding. Henry M. Hobart, Niskayuna, N. Y., assignor to General Electric Company, a Corporation of New York.

1,745,828. Radiator Attachment. Amos Barnes, Pontiac, Mich.

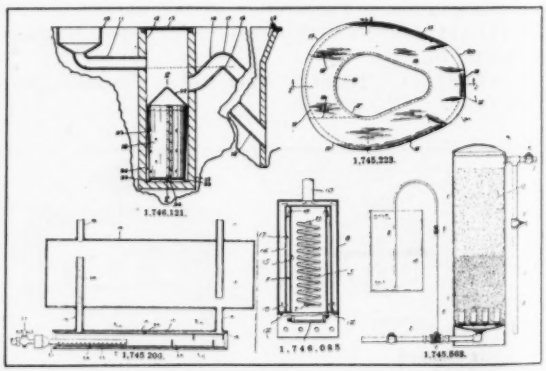
1,745,904. Heating, Humidifying, and Ventilating Appliance. Charles A. Moore, Edina, Minn.

Plumbing Department

1,745,563. Water Softener. Edward T. Turner, Dayton, Ohio.

1,746,085. Shell for Water-Heating Coils. Archibald L. Leitch, Marine City, Mich.

1,746,121. Sewer Catch Basin. Adolph Levy, Cincinnati, Ohio.



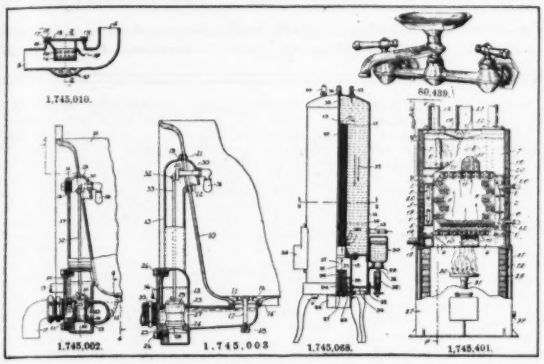
1,745,206. Water Heater. Ervin Cahow, Hollywood, Calif.

1,745,223. Toilet-Seat Cover. Rose Light, Canton, Ohio.

80,439. Combination Soap Dish and Faucet. James Fraser, Hillcrest, Edge Moor, Del., assignor to Speakman Company, Wilmington, Del., a Corporation of Delaware.

1,745,002. Bath with Integral Waste. Frank G. Brotz, Kohler, Wis., assignor to Kohler Company, Kohler, Wis., a Corporation of Wisconsin.

1,745,003. Combination Waste Connection. Frank G. Brotz, Kohler, Wis., assignor to Kohler Company, Kohler, Wis., a Corporation of Wisconsin.



1,745,010. Disinfecting Device for Sanitary Flushing Tanks. Rodolph de Lamprecht, Vancouver, British Columbia, Canada, assignor of one-half to Alfred Shaw, Vancouver, British Columbia, Canada.

1,745,068. Electric Boiler. Louis H. Veronneau, Montreal, Quebec, Canada.

1,745,401. Water Heater. George A. Bryan, Peru, Ind., assignor to Bryan Steam Corporation, a Corporation of New Mexico.

1,744,703. Process of Making a Water-Softening Material of the Exchange-Silicate Type. Frederick K. Lindsay, Minneapolis, Minn., assignor to Arizona Minerals Corporation, Yuma, Ariz. A process of making a water softening material which consists in producing a gel material from a mixture of sodium silicate and sodium aluminate, agitating this mixture, adding thereto granular particles of silica or sand while the mixture is being agitated and at the time gelation has begun to take place, and after complete gelation drying the resulting product.

1,746,170. Process for Carrying Out Washing Operations with Hard Water. Gustav Ullmann, Vienna, Austria, and Willy Seck, Augsburg, Germany. In a process of laundering in hard water the method of rendering harmless the substances contained in said water and which cause hardness thereof, consisting in adding to the water and ordinary soap a compound obtainable by sulphonating a polynuclear aromatic hydrocarbon containing an alkyl side chain with more than two carbon atoms and then treating a fatty oil with the reaction product in the presence of concentrated sulphuric acid, said compound forming a water-soluble calcium salt and having colloidal properties, in a proportion less than the quantity chemically equivalent to said substances contained in the water.

◆

East Orange, N. J.—The Stephens Co. has been organized and incorporated, with a capital of $25,000, to establish and operate a heating contracting business. The new concern is represented by the New Jersey Registration Trust Co., East Orange.

New Haven, Conn.—The United Plumbing and Heating Co. has incorporated to engage in the plumbing and heating contracting business with a capital of $50,000. The incorporators are Nathan and Fannie Pycone and Edward H. and Dora Teitelman.

Sioux City, Ia.—The Fred E. Ebert Plumbing and Heating Co., capitalized at $25,000, has been incorporated with F. E. Ebert as president and Mary Ebert as secretary.

Sioux City, Ia.—The Scott Plumbing and Heating Co. has been organized and incorporated with a capital of $10,000, to engage in the plumbing and heating contracting business, by David Scott and Elsa Scott.

4'x5' Oval Float

NO-SOL COPPER FLOATS

No-Sol Floats incorporate all features necessary to the satisfactory performance of a tank float.

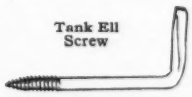
5" Round Float

Each float is individually tested and guaranteed.

The AYLING & REICHERT CO.
3047 N. Erie St. Toledo, Ohio

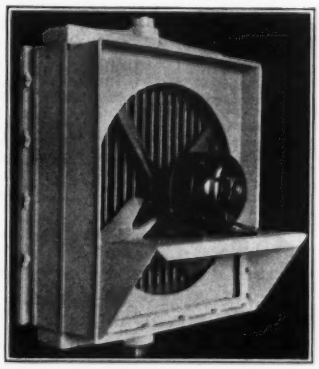
Closet Bolt

Hindley Specialties are your best bet for quick work and work that will last long. Buy Hindley Specialties for more speed! Write for particulars.


Tank Ell Screw

Hindley Mfg. Co.
Valley Falls R. I.

DIXIE UNIT HEATERS



Specify and install the unit heater with the patented compression coupling which a five ton pull could not break.

Write for the details of the Dixie Unit Heater

THE DIXIE BLOWER COMPANY
1351 W. 37th Pl., Chicago

DOMESTIC ENGINEERING's Retail Advertising Service makes advertising easy for you—all you do is clip the copy from your copy of the paper and hand it, with the cut we send you, to your newspaper. Only $4.20 for 12 illustration cuts. Clip this, attach your check for $4.20 and mail today.

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1900 PRAIRIE AVENUE, CHICAGO, ILLINOIS

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8 cents for each word including heading and address. Count seven words for keyed address. Minimum $2.00 for each insertion. One inch $4.00.

Situations Open

SPECIALTY SALESMEN SELLING AGENTS

A large manufacturer of an exclusive line of plumbing specialties, having over three hundred leading Supply Houses as Distributors covering nearly every large City in the Country, has arranged with those Distributors to form a liaison contact for them in securing the services of independent specialty salesmen or selling agents who are calling on the Plumbing and Heating trade direct.

Full co-operation is extended by both Manufacturer and Jobber and a liberal straight commission arranged that will pay a very substantial income on honestly applied effort.

Replies confidential and complete information about yourself is solicited. Address Key 484, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

REPRESENTATIVES WANTED IN leading cities to handle highest grade line of radiator shields and radiator cabinets. Our representatives earn $500.00 to $1,000.00 per month the year around, above expenses. Full selling plan furnished. Address Key 256, "Domestic Engineering," 1900 Prairie Ave., Chicago.

Gas Service Beyond the Gas Mains!

The opportunities in this vast fertile market are needless to repeat. They are offered to men of successful sales experience, who can see and profitably interpret the value of a co-operative sales program which includes the plumber to a large extent, yet without being dependent on the plumber to make sales for him. This method of gas supply is an automatically operated gas system installed in buildings beyond the gas mains, producing high heat value gas within city costs. Only detailed information about yourself will bring you the complete proposition. TIRRILL GAS MACHINE CORPORATION, 50 Church Street, New York City.

SALESMEN—AN OLD ESTABLISHED house making a full line of plumbing specialties in brass, leather, rubber, etc., could use local representatives in the principal cities of the United States to sell their line, either whole or part time, on a straight commission basis. A very liberal proposition with full settlement at end of each month. This is a high-grade line, with many exclusive items. Will bear the closest investigation. We will not consider anyone who does not at present have a trade acquaintance in their respective city. If you are a resident of one of the larger cities and have a following among the plumbing trade, we can put you in a position to make good money, providing your territory has not yet been allotted. Reference required. All replies treated in strict confidence. Address, stating qualifications, etc., Key 369, "Domestic Engineering," 1900 Prairie Ave., Chicago, Ill.

SALESMEN — EXPERIENCED IN selling a complete line of exclusively high grade plumbing brass goods direct to plumbing contractors. Applicants must own and drive auto and be thoroughly established in territory for which they apply. Give full particulars in application with references, experience, etc. Commission with drawing account, after ability has been proved. Address Key 480, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

SALESMAN WANTED BY PLUMBING and heating jobber located one hundred miles from New York City. Prefer one with knowledge in electrical supply line. Reference required. Address Key 477, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

WONDERFUL MONEY-MAKING EXclusive or side-line proposition for salesman calling on plumbing dealers. Write us today. Address Koil-Les Heater Company, Geneva, Illinois.

BOILER SALESMAN FOR CHICAGO territory. Must have good general acquaintance with local heating contractors and at least one year's experience selling steel heating boilers in Chicago. Address Key 474, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

NATIONALLY KNOWN MANUFACturer of complete line of plumber's woodwork desires to secure responsible manufacturer's agents in Boston, New York State exclusive of New York City, Philadelphia, Baltimore, Pittsburgh, Atlanta, Richmond, Cleveland, Detroit, Minneapolis, Des Moines, Denver, Dallas, Los Angeles, San Francisco, Seattle. Please outline territory and lines handled to be held in strict confidence. Address Key 491, "Domestic Engineering," 1900 Prairie Avenue, Chicago, Ill.

REPRESENTATIVES FOR LARGE manufacturing company of flushometers. Territories open for live, aggressive salesmen or sale organizations. Must have contact with leading architects and jobbers in your territory. All answers will be held in strict confidence. Address Key 483, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

SALESMEN WANTED—BY OLD EStablished firm to handle complete line of Plumbers' Brass Fixtures on commission. Good territories and opportunities open. Address Key 488, "Domestic Engineering," 1900 Prairie Avenue, Chicago, Ill.

HEATING ENGINEER, ONE CAPABLE, laying out heating jobs for plumbing and heating contractors, in the metropolitan district. Life time opportunity for right man. Address Key 486, "Domestic Engineering," 1900 Prairie Avenue, Chicago, Ill.

Lines Wanted

EXPERIENCED PLUMBING AND heating sales representative now covering eastern Pennsylvania, southern New Jersey, Delaware, Maryland and Washington, D. C., with headquarters at Philadelphia, desires one or two additional lines on commission basis, selling to jobbers. Address Key 490, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

WILL CONSIDER PROPOSITION ON pottery and brass on commission basis, covering wholesalers in eastern Pennsylvania, New York State, southern New Jersey, Maryland and Delaware, or part of same. Now handling non-conflicting line. Address Key 487, "Domestic Engineering," 1900 Prairie Avenue, Chicago, Ill.

A BOOK YOU'LL REFER TO EVERY DAY

BOOK DEPARTMENT

DOMESTIC ENGINEERING

1900 PRAIRIE AVE. CHICAGO, ILL.

[Pierce's Practical Manual]

Here's the handiest book on Steam, Vapor and Hot Water Heating that you've ever seen. It covers almost every point in heating in a practical, easy-to-understand and apply manner.

Chimneys, Figuring Radiation, the British Thermal Unit, Heat Loss, Piping, Pipe Sizes, Boilers, and Boiler Ratings are a few of the subjects which it covers.

If you haven't got this book, get a copy, now. Send Check or money order for $3.00 today.

ADVERTISING

Cash must accompany order. Copy should reach us eight days in advance of publication date.

Situations Wanted

PLUMBING AND HEATING EXECutive with twenty years' experience in Superintendence and Management, who is also a Graduate Engineer, desires to make change, available on short notice. Address Key 485, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

Lines to Handle

SALES AGENTS WANTED BY WELL known manufacturer of a complete line of brass valves. This includes competition and heavy pattern gates, globes, angles and check valves as well as a full line of radiator valves. Several very desirable territories open for a producer having proper qualifications. Address Key 481, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

SPECIALTY SALESMEN: CALLING ON plumbers southern Ohio, northern Kentucky, side line, large profits. Address Holland Metals Company, Reading, Ohio.

WANTED: LIVE WIRE SALES ORganizations located in Cincinnati and St. Louis to handle complete line of plumbers' brass goods on commission. Particulars necessary for consideration. Address Key 489, "Domestic Engineering," 1900 Prairie Avenue, Chicago, Ill.

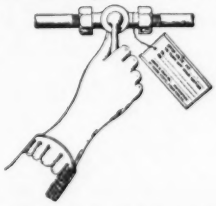
LUSTROUS ALUMINUM STOVE PIPE beautifies a gas stove, and lasts a lifetime. Every plumber and stove dealer is a prospect. Territories open. McCARTHY MFG. COMPANY, Pear Avenue, Cleveland, Ohio.

MANUFACTURERS' REPRESENTAtives wanted: to sell frost proof closets and plumbers specialties to the jobbing trade. Several good territories open. Only those calling on the wholesale trade need apply. References required. Address Key 482, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

WANTED — MANUFACTURERS' agency representation in the territories of Kansas City and vicinity and various points in the state of Texas. As our line is a high class heating line, we do not wish to hear from anyone unless he is familiar with the heating trade in the territories above mentioned. Address Key 439, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

Miscellaneous

Hadco Stop Valve Tags



An Everlasting And Non-Soiling Advertisement for the Plumber

Printed with your name and address make an everlasting advertisement. Send for samples and prices.

HADDON BIN LABEL CO.
Haddon Heights, N. J.

PORTABLE PIPE MACHINES
LIKE NEW—Used on one job

6-in. Oster Pipe Machine, mounted on 4-wheel truck and driven with a gasoline engine.

4-in Oster Pipe Machine, mounted on 4-wheel truck and driven with a gasoline engine.

2, 2-in. Oster Pipe Machines, mounted on 4-whee truck and driven with a gasoline engine.

THE O'BRIEN MACHINERY COMPANY
113 North Third St. Philadelphia, Pa.
Long Distance Telephone: Market 0727
Cable Address: "OBRIEN" PHILADELPHIA

The Most Reliable
PIPE COUPLING BUYERS
In The Country

Write us about your surplus pipe couplings

CAPITOL MFG. & SUPPLY CO.
550 Nicholas Street, Columbus, Ohio

STOP "GUESSTIMATING"
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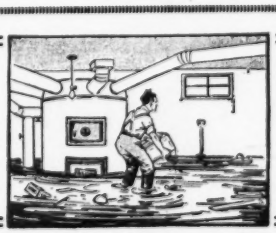

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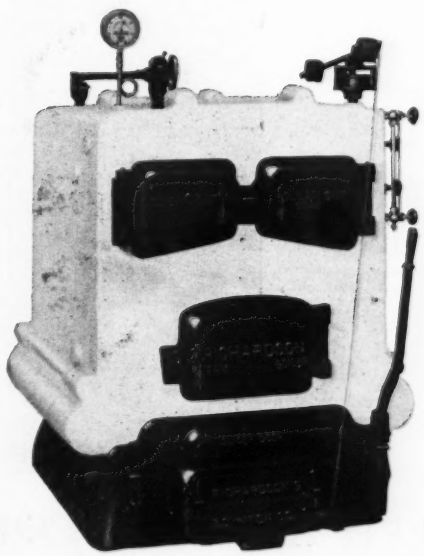

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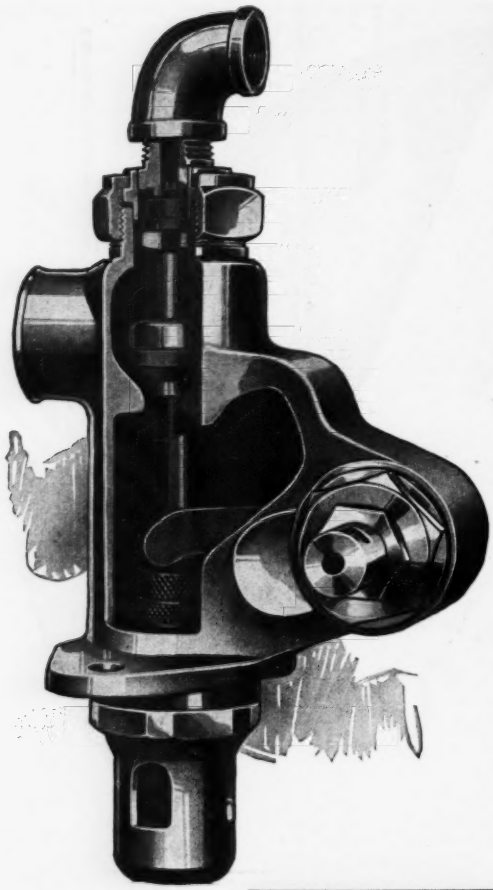

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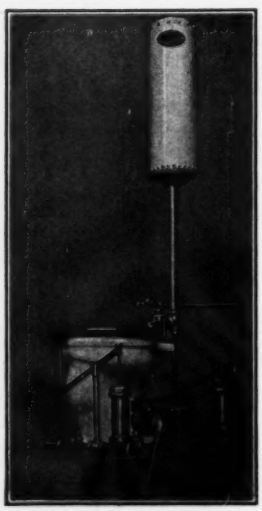

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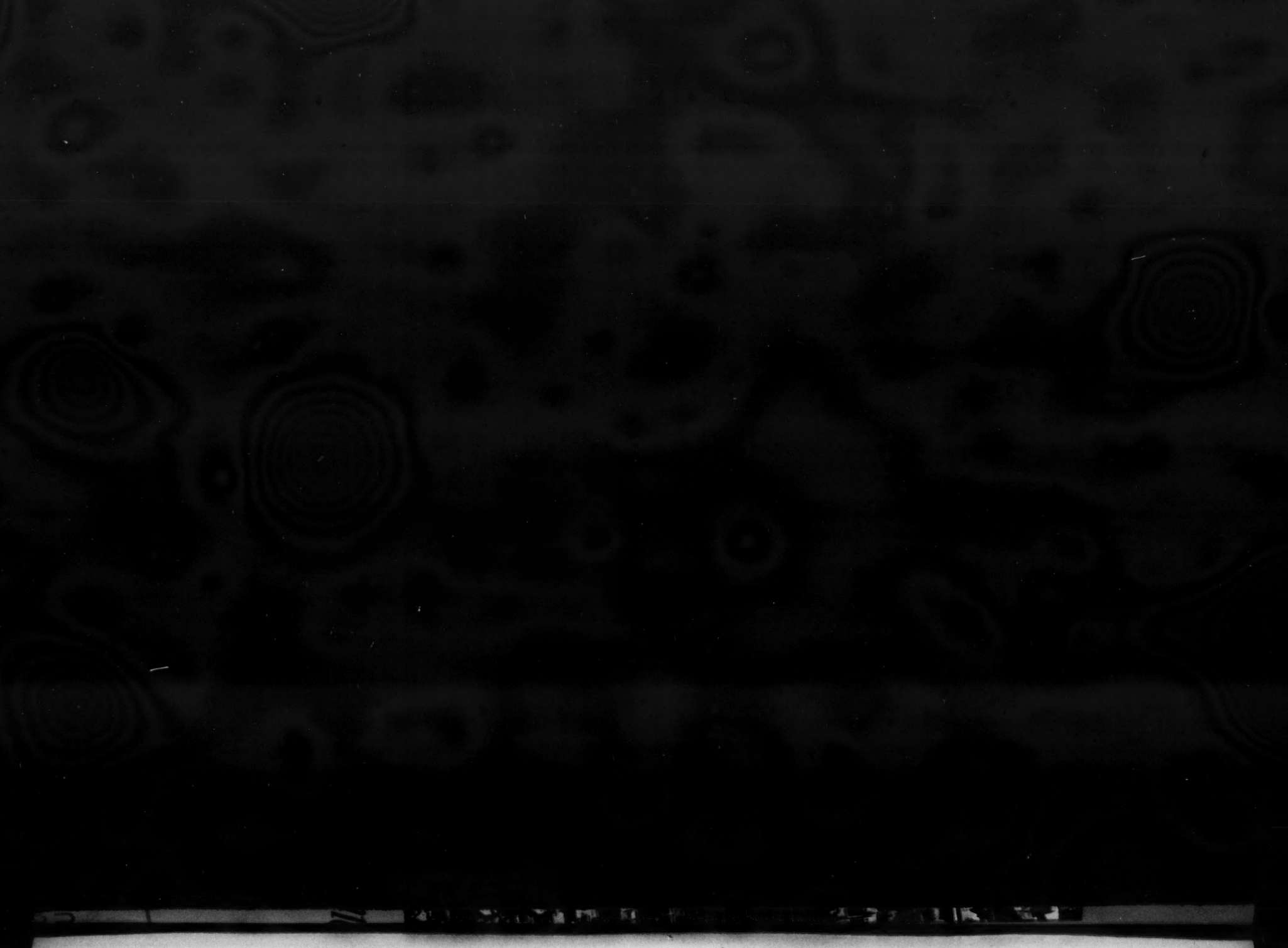
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